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PART I: MAIN REPORT

OF

AGRICULTURAL SECTOR REVIEW, INDONESIA
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Prepared by:

John W. Mellor (Chief of Party)
Walter P. Falcon
Donald M. Taylor
Bustanul Arifin
E. Gumbira Said
Effendi Pasandaran
(agreview@telkom.net)

CARANA
CORPORATION

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EXECUTIVE SUMMARY

Indonesia clearly demonstrates that high agricultural growth rates are at the core of employment increase and poverty reduction. The impact of agricultural growth on employment works principally through heightened demand for the enormous, labor- intensive, rural non-farm sector, which depends primarily on rising farm incomes to bolster increased demand and growth.

Indonesia's previous period of rapid agricultural growth, employment growth, and poverty reduction centered successfully on rice. The correct combination of technological advancements in rice yield mixed with large, targeted rice production programs resulted in phenomenal growth rates.

Now, the basis for rapid agricultural growth must focus on high-value commodities of smallholder estate crops, horticulture, livestock, and fisheries. Growth in those sectors can propel overall agricultural growth rates to new highs, but the requirements are far more complex than for the rice sector.

Only a return to sustained, rapid growth in rural incomes can bring the employment growth and poverty reduction needed to address equity, security, education, and environmental needs that currently are such a challenge to the Indonesian polity. At the conclusion, this report proposes a set of recommendations in policy, technology, and agribusiness to actualize Indonesia's promise of accelerated growth in farm productivity and incomes.

A Brief History of Poverty in Indonesia

Indonesia, in the 1960s and earlier, was the classic case of massive, boundless rural poverty. Poverty levels were on the order of 70 percent of the rural population. A copious literature, epitomized by Clifford Geertz's classic paper on agricultural involution, explained why entrenched economic and social systems would never allow escape from such poverty.

In the late 1970s and the 1980s, new International Rice Research Institute (IRRI) rice varieties adapted by the Indonesian rice research system, and national commitment to rice production self-sufficiency (i.e. BIMAS program) brought an unprecedented growth rate to agricultural production. The BIMAS program equipped farmers with low cost knowledge, fertilizer and credit, while other programs ensured stable, incentive prices. The result was an extraordinary decline by 2/3 in the proportion of the population in poverty.

In the 1990s, the agricultural growth rate slowed and then came to a halt, despite large increases in agricultural prices, which were prompted by the massive currency devaluations. As a result, poverty levels increased substantially, decreased slightly, and then fluctuated around a steady level of poverty.

Why the Connection Between Agricultural Growth and Poverty Reduction?

The poor are the landless or near landless whose incomes come substantially from the rural non-farm sector. Not included in this category are people whose income derives mostly from farming

their own land and who are primarily employed in farming. They are not poor since they have income from relatively full employment as well as from the land they own.

The rural non-farm sector produces labor-intensive goods and services, which cannot be exported due to low quality and high transactions costs. Farmers and the multiplier from farmers' expenditures are the primary source of demand for these non-exportable goods and services. Growth of the rural non-farm sector depends on rising farm incomes to supply that demand. Dual advantages are reaped by accelerating agricultural growth—raising farm incomes and employing the poor. Thus, poverty reduction is driven by increased agricultural productivity and consequent demand-driven gainful employment for the poor.

There is a parallel between farmers' economic well-being and employment rates. In the booming 1980s, farmers prospered and rural employment soared. In the 1990s, farmers prospered less and rural poverty increased. During the 1997/1998 financial crises, farmers prospered from higher food prices and contributed to growth in employment. Despite the upsurge in rural employment, those in the bottom quintile of the income distribution were poorer and worse off. While farmers' prosperity was due to higher food prices, the poor who spend most of their income on food purchases were hurt severely by the higher food prices.

How Will Agricultural Production Grow in the Future?

In the future, the main driving force for increased agricultural productivity gains will come largely from high value commodities – smallholder estate crops, horticulture, livestock, and fisheries. Currently, they comprise about 54 percent of agricultural production, but will account for 80 percent of growth in output. Of course, rice is still important, representing about 26 percent of the value of agricultural production, but its importance is much smaller than a few decades ago. Even with high growth rates in yields, rice is unlikely to account for much more than 10 percent of incremental output. Rice continues to be important, but not dominant, as was the case in the 1980s. As the country prospers, expenditure on rice will grow very slowly and will eventually decline, as Indonesia does not have a comparative advantage in rice exports, as a means of taking up the slack in demand.

The new sources of growth bring new problems to solve. Macroeconomic policy and physical infrastructure are even more important than in the past. Research is just as important, but will be far more complex with difficult challenges of priority setting, private sector interactions, and realizing biotechnology potential. New types of agribusiness are vitally important and face a myriad of policy, institutional and investment needs. Failure in resolving these issues will result in little employment growth, undiminished poverty, greater rural/urban income disparities, rural unrest, and increased school dropout rates.

Why is Foreign Aid Particularly Important to Agricultural Growth?

The Government of Indonesia has a largely urban-based political system, as is typical in Asia, that under-emphasizes the critical needs of agriculture. Foreign aid was important in helping to shift emphasis to the rural sector in the previous period of rapid growth. It could do so once again. In addition, rapid agricultural growth is possible because of the potential to catch-up with front-

runners. Foreign technical assistance brings the knowledge of best practices that makes catch-up growth possible.

The United States, in particular, has a comparative advantage in agricultural technology, in policy, and in certain aspects of agribusiness, as well as a distinguished historical record of assisting rapid agricultural growth across Asia. The United States has a strong leadership role in the donor community on agricultural policy and policy analysis and needs to support that role with quality policy analysis.

The Critical Role of Agricultural Policy

Shifting to a new strategy of agricultural productivity and income growth requires a new approach and increased support to agricultural policy analysis and implementation. Given a changed thrust, a substantial input of transnational experience becomes particularly important. Because the strategy needs to change, the first requirement is a priority setting exercise. There is much to do and not all can be successfully done at once. Properly done, such an exercise is complex and time consuming, involving broad stakeholder participation, difficult priority setting efforts, and substantial input from the experience of other countries.

That priority setting exercise will assist in setting priorities for in depth policy analysis. An outcome will be the identification of several macro policy issues vital to high value commodities and exports, interactions with other sectors such as physical infrastructure and education (both now constraining to high value commodity production), and a range of issues specific to the agribusiness sector that is vital to high value commodity growth.

Effective policy analysis will require further institution building, particularly at the regional level, new efforts to build trade association capacities, and assistance in policy advocacy, particularly to the trade associations.

Foreign assistance can expand access to knowledgeable personnel to work on these issues, can forge links among researchers in regional and national institutions, can disseminate knowledge of international best practices and experiences, and can inform the foreign aid donor community as it interacts on key policy issues.

The Basis for Productivity Increase – Research and Technology Generation

Another important component for agricultural productivity growth and international competitiveness is research. Agricultural research is particularly critical because of the major opportunities for yield and quality increase; cost reduction from the new frontiers of biological research; and efficiency in land use and conservation technologies.

The Indonesian research system is grossly under-funded as compared to other countries. Dispersed fund allocation leaves competent researchers woefully short of the support they need for good research. The system is over-extended in terms of the range of problems tackled relative to the support capacity. The yields of commodities need to increase, and the gaps between yield potential and actual yields need to be closed in order to achieve the agricultural strategy.

Biotechnology offers huge efficiencies in research, and Indonesia should incorporate and utilize the latest in research techniques. The appropriate regulatory and advocacy systems must be developed to ensure rigorous compliance with appropriate rules. In the new agricultural growth context there are great deficiencies in the post harvest technologies of high-value commodities that need to be alleviated. Emphasis on increasing production efficiency and quality improvement for international markets and domestic supermarkets are imperative. Foreign assistance is crucial to moving ahead in biotechnology and capacity building in the post harvest technology for high value commodities.

Agribusiness Systems Development, Constraints, Opportunities and Strategies

The overarching constraint to further development and growth of Indonesian agribusiness is the lack of adequate investment in the agricultural sector. Necessary for achieving international competitiveness, improving Indonesia's agribusiness will require increases in the level of public and private sector spending, as well as prioritizing the activities to be covered by such expenditures.

Significant improvements in the agribusiness systems will produce the greatest impact on sales and production of horticultural, livestock, fisheries products, and smallholder estate crops; profitable market growth in horticultural commodities being the most immediate. Agricultural growth must be led by demand. The current surge of the supermarket sector is already creating rapid growth in production and improvements in quality, particularly for horticultural products.

Given the limitations on government and donor resources, using these resources to address systemic problems within agribusiness will be more productive than applying scarce resources to improving individual commodities or even commodity systems. Priorities will have to be set among a wide range of systemic problems, including policy, physical infrastructure investment, the role of local governments, and quality control and regulation issues.

In Conclusion:

A change in agricultural development strategy away from a dominating dependence on growth in rice and corn production to the high value commodities can bring a return to high agricultural growth rates. The benefits will be immense in employment growth and all the factors so related to employment growth, including security, stability, participation in education, and regional equity. However, rapid growth in high value commodities requires a new strategy, new priorities, new approaches to policy, new priorities in research, and a major effort to assist the new forms of agribusiness that are central to high value commodity growth.

Chapter 1

Introduction and Background

This report was prepared at the request of the United States Agency for International Development (USAID) to provide an assessment of agricultural development in Indonesia. The priorities and focus of the assessment were guided by an interest in the value of the assessment in assisting the identification of alternative interventions by which the U.S. might be useful. An integral part of the process was intensive interaction, both with individuals and in focus groups, with a cross section of leading Indonesians knowledgeable on the problems and needs of the sector.

1.1 Objective

The objectives of the mission as stated in the Scope of Work (see Part III, Annex I) are complex, but may be roughly summarized in two parts: provide technical collaboration to the Indonesian agricultural community "in reviewing the state of Indonesia's agriculture in light of global best policies and practices and encouraging greater economic rationality/efficiency in the agricultural sector while striving to reduce poverty;" and, assist USAID/Indonesia in defining its support to the agricultural sector and to identify options and collaborative activities for USAID/Indonesia and AID/Washington. The scope of work for achieving these objectives states two major tasks. A summary review of the relevant trends and the current state of agriculture and its strengths and weaknesses. Identification of alternative interventions in which US leadership and technology transfer would be useful in increasing the competitiveness and contribution to economic growth and prosperity of the agricultural sector. Part I covers the review objective. Part II covers the recommendations to USAID. Part III includes annexes and background materials.

1.2 Background of USAID Emphasis on Agriculture

The scope of work for the mission provides a review of USAID emphasis on agriculture. It notes the 2001 statement of USAID/W commitment to renew its leadership in the provision of agricultural development assistance with emphasis on agricultural science based solutions to problems, development of trade opportunities, bridging the knowledge gap at the local level, and promoting sustainable agriculture and environmental management. In its 2002-strategy statement, the Asia and Near East Bureau encouraged missions to include agricultural activities in their portfolios with specific mention of policy, trade, information technology and biotechnology, environment and water policy, and high value crops. In its feedback to the Mission's

Indonesia 2002 annual review, AID/W noted the agency's recognition of the important role of a dynamic and productive agriculture sector and stated, "the Mission should conduct an agriculture assessment of the sector, and identify opportunities for the US to assist in strengthening the agriculture sector."

The team composition, approach and report were developed to meet these needs. Specifically the report emphasizes the recent history of agricultural development in Indonesia, the current problems the sector faces and its opportunities for the future, and then provides an analysis of policy, technology, and agribusiness in the high value commodity sub-sectors. These three areas are of special importance on work most in need of USAID support.

1.2.1 Team Composition

The team was comprised of three Indonesians and three Americans (the CVs are attached in Part III, Annex IV).

Bustanul Arifin, Associate Professor, Department of Agricultural Economics and Social Sciences at the University of Lampung, and Senior Economist, Institute for Development Economics and Finance, has been carrying out intensive analysis of the development of the Indonesian agricultural economy, including dividing the development into six major phases that spotlight key policy and developmental issues. He has been a leading thinker on agricultural policy issues. Arifin had principal responsibility for drafting Chapter 3, including the review of stages of agricultural growth and joint responsibility with Mellor for the agricultural policy component.

E. Gumbira Sa'id, Academic Director, Master in Agribusiness Management at IPB, has an extraordinarily wide set of contacts in the agribusiness sector and has been a leader in developing training and analysis in agribusiness. Sa'id had joint responsibility with Taylor for the agribusiness components.

Effendi Pasandaran, Senior Researcher, Agency for Agricultural Research and Development at the Ministry of Agriculture, has a long experience in all aspects of agricultural research and technology development and has been a leading thinker about development of the agricultural research system. Effendi had principal responsibility for Chapter 5 on technology.

Walter Falcon, Co-Director, Center for Environmental Science and Policy, Stanford University, has many years of experience with Indonesian policy as well as development of the agricultural technology sector, particularly including its interactions with the international system, within which he has served in several key positions. Falcon, who did not accompany the team to Indonesia, made a substantial input in the technology and the policy components as well as providing overall guidance.

Don Taylor, Independent Consultant, has been working throughout Asia in the development of agricultural business systems with emphasis on high value commodities. He brings a large practical experience in private sector activities. Taylor had principle responsibility for Chapter 6, the agribusiness component. John Mellor, Vice-President, Abt Associates, Inc. is the leading thinker on the dominant role of multipliers from agricultural growth to employment growth and poverty reduction, and to setting priorities within strategies for achieving rapid agricultural growth. Mellor had principal responsibility for Chapter 2, tracing the importance of agriculture and particularly its interactions with poverty, as well as joint responsibility for the policy sections.

The team used its wide contacts to achieve focused discussions with policy analysts and practitioners, agricultural scientists, businesspersons in the agricultural business sub-sector, and farmers.

1.2.2 Team Approach

There is an immense literature on development of Indonesia's agricultural sector (see the references in Part III of this report). The team accumulated a large cross section of that literature, read and analyzed it with care and placed it in the context of its own in-depth experience in Indonesia and a large number of other countries, several of which have preceded Indonesia along the path of rapid agricultural development. Given the unusual depth and breadth of this literature, this was a major part of the Mission's effort.

The Mission then met with a large number of persons from the Government of Indonesia, the private business sector, farmers, and the foreign assistance community (see the list of persons met by the team in Part III, Annex III). These meetings gave particular emphasis to a series of meetings with the Asian Development Bank team that has a scope of work quite similar to ours but using a 21 person team over a period of 7 months, and to meetings with World Bank staff who have a long history of similar analyses in Indonesia as well as a large portfolio of agricultural development projects.

The mission then organized and participated actively in five focus group meetings that encompassed a broad range of private sector operatives in agriculture, government, and academia. Three of these meetings were in outlaying areas, Makasar, Surabaya, and Medan to facilitate a sense of regional diversity. One was in Bogor to accommodate major figures in government and practitioners in the Jakarta/Bogor area, and one was in Jakarta to accommodate USAID personnel and various USAID contractors. Close to half of the team's 28 days in Indonesia were devoted to preparing for and attending these focus groups. Part III, Annex IV provides a list of those attending each of these focus groups. Volume II of this report provides reports on the proceedings of each focus group.

By the time these focus groups met, the team formed preliminary judgments on many of the key issues. Thus an agenda was prepared (see Part III, Annex IV) that

spotlighted key issues. These were presented in a brief initial presentation. The bulk of the discussion was given to open discussion that was free ranging and moving beyond agenda items to other issues the participants thought important.

On the basis of the three sources of input, plus the team members' own knowledge, a draft report was prepared, and was reviewed by USAID and others. The final report was prepared in response to that review.

1.3 Report Content

The team effort and this report focus on required priorities if agriculture is to play its critical role in employment growth. The direct and indirect effects of rapid agricultural growth drove an earlier period of extraordinarily large decline in poverty. The report discusses that relationship and shows that returning to that rapid growth rate will have a very different commodity composition as compared to the earlier growth and will therefore require quite different patterns of investment, policy and institutional development. It then discusses the changing structure of the Indonesian economy, and how the seeds of the current stagnation in agricultural performance grew from changes in policy and investment in the late 1980's and the 1990's. The report then focuses on three critical areas of change that will be required if rapid growth is to return. Those are in policy, technology development, and agribusiness development.

1.4 Deliverables

Three components are delivered to the Mission:

Part I. A report on the findings of the Indonesian agricultural sector assessment for general distribution , and a copy of the Executive Summary, and

Part II. A report on options for future interventions/collaborative activities for USAID and AID/Washington use.

Part III. A reference report that includes introductory materials, bibliographies, and curriculum vitaes.

Drafts of these reports were provided prior to the Mission departure on August 14. The final copy has been provided after receiving the Mission's comments on the draft.

Chapter

2

J0B CREATION: DOMINANCE OF THE AGRICULTURE DRIVEN RURAL NON-FARM SECTOR

Sixty two percent of all employment in Indonesia is rural, roughly evenly divided between agriculture and the rural non-farm sector, for which effective demand comes entirely from agriculture and its multipliers. The rural non-farm sector is largely non-tradable (its demand cannot come from foreign markets), and uses very little capital that does not compete with the urban industry.

Thus, whether Indonesia's employment problem is to be solved or not is dependent on accelerating the agricultural growth rate from its present level of stagnation to previous high levels of the 1980s. The latter occurred when employment last grew rapidly, and its corollary of poverty declined rapidly. Agriculture stimulated employment growth is also the primary source of demand for educated people in rural areas. Therefore, it is essential to match planned rapid growth in the supply of educated people.

During the period of extraordinarily swift poverty decline in Indonesia, agricultural growth was the driving force (Ravallion and Huppi 1989). The sharp slowdown of agricultural growth in the 1990s was accompanied by dramatic increase in poverty rates (World Bank 2000 and Center for Agro-Socioeconomic Research 2000).

The slowdown in agriculture occurred at the same time the acute financial crisis drastically reduced urban and manufacturing based employment. The crisis slowed some parts of agriculture, such as urban demand dependent livestock and horticulture. However, the sharp increase in agricultural prices associated with the major currency devaluations boosted the incentives for agricultural production. Thus, the slowdown in agricultural growth, associated decline in employment growth, and increase in poverty was not the product of the financial crisis. Rather they derived from failure of agricultural growth strategy and policy that trace back to the pre crisis years of the late 1980s and early 1990s. This was also the period when foreign aid agencies, almost without exception, drastically reduced their support for agricultural growth.

If employment is to grow rapidly in Indonesia over the next few decades, it is essential that the rate of agricultural growth accelerate greatly from the stagnant levels of the past several years. That will be even more important when rapid growth returns to the manufacturing sector. Manufacturing growth without agricultural growth will result in wider rural/urban income disparities, and consequent rural dissidence.

The full argument for a major thrust in agriculture goes beyond its dominant role in employment creation. First, and most important, there is potential in agriculture to immensely increase resource productivity. With investments in crop research and

agricultural facilities, labor productivity and farm incomes will soar through higher crop yields and cropping, and higher livestock production intensity.

Second, even though it has declined to 15 percent of total GDP, agriculture is still a major component of the Indonesian economy. Compared to other sectors that are considered important and relatively labor intensive, agriculture is roughly two times larger than the tourism sector as a source of GDP, and several times larger than the textile, leather and footwear sector (WTO 2003).

Third, agriculture drives the rural non-farm sector and the combination of agriculture and the rural non-farm sector employs over 60 percent of the labor force. Expenditure of increased farm income creates more productive employment in the rural non-farm sector. The great disparity between the proportion of the labor force employed and the share of GDP is not a reflection of inefficiency in the rural sector. Rather, it is a reflection of the labor intensity of production in the sector and particularly in the rural non-farm sector. Even in the relatively labor intensive manufacturing sector that characterized much of the Indonesian expansion a significant proportion of income goes to capital, whereas in the rural sector the capital intensity is very low and the bulk of returns go to labor. Indeed the rural non-farm sector uses far less than one tenth as much capital per worker as the more labor-intensive components of the manufacturing sector.

Fourth, agricultural growth is important to political stability, as it provides rural areas with jobs and incomes. It has the potential to bring together all of the geographically dispersed parts of the nation. For example, small landholding estates outside of Java are critical in stabilizing rural unrest, and in contributing to higher agricultural growth by planting high value commodities crops. The same can be said of horticulture, livestock, and fisheries production.

Fifth, agricultural growth stimulates the desired dispersed pattern of urban development to ease congestion and centralization. There are two main models of urban development as exemplified by neighboring Asian countries. In Taiwan, the dominance of small and medium scale enterprises is geographically dispersed outside of the largest cities. Alternatively, Korea demonstrates the effects of manufacturing growth followed by agricultural growth. It has a high concentration of very large manufacturing firms centered in a few, large port cities. The dispersed pattern is healthier from environmental and social points of view.

Sixth, agricultural growth provides a tax base for decentralized government, which in turn adds to the democratization process. A local tax base can enhance devolution of responsibility and democratization. Without vigorous agricultural and rural growth, the decentralization process depends on central government revenues.

Seventh, agricultural growth has a complex, but potentially positive role, in biodiversity preservation that is closely related to its employment generation and poverty reduction role.

Of the many basic forces favoring agricultural growth, this chapter focuses on the aspects of augmented productivity, income generation, employment growth, and poverty reduction. It then proceeds to set forth a few key areas of policy, institution, and investment development, which are essential to rapid agricultural growth. The backbone of rural development, small commercial farmers are potentially highly efficient and productive, if given support from a vigorous, competitive private input supply and marketing sector, and provision of critical public goods.

2.1 Concept and History

Economic theory, cross national and cross regional statistical analysis, and Indonesian data consistently demonstrate the dominant force of agriculture in employment growth and poverty reduction for low- and middle-income countries (Mellor and Desai 1985, Timmer 1997, Aluwalia 1978, Mellor 1976). The indirect effects of agricultural growth largely stimulate the rural non-farm sector. Rising incomes of small commercial farmers are spent primarily in the employment-intensive rural non-farm sector (Delgado 1998, Hazell and Roell 1983, Mellor 1995). Due to the low quality and high transactions costs of their goods and services, small producers of rural non-farm goods and services draw upon local incomes as the primary source of demand. Agricultural incomes drive the process. The rural non-farm sector cannot grow rapidly without high rates of agricultural income growth.

Higher farm incomes invigorate the local economy, and have a multiplier effect to generate more immediate and tangible results in affecting people's lives. Prospering farmers enlarge their houses, purchase locally made furniture and garments, and utilize a wide range of services. They increase consumption of labor-intensive agricultural products, such as livestock and horticulture. By hiring laborers outside of the family, farmers create more employment opportunities for the community. In addition, social improvements in childhood education, women's participation in child rearing and non-farm activities, and marketing activities by the head of household subsequently improve.

Agricultural income, directly and through its multiplier forces, drives small and medium size rural enterprises. Since the majority of small enterprises are located in rural areas, investments in rural development fuel employment growth and poverty reduction. The dominant constraint on expansion of rural enterprises is effective demand for their output (Liedholm and Meade 1987). Based on productivity increases in agriculture, rising farm incomes provide that demand.

Comprising a large proportion of the economy in low-income countries, agriculture is a major force in determining the rate of economic growth, and dominates poverty reduction. Agriculture tends to have a modest impact on GDP growth in middle-income countries due to the burgeoning composition of the manufacturing and industrial sectors. However, agriculture remains the dominant element in employment growth and poverty reduction because agriculture and the rural non-farm sectors are so employment intensive. Even in middle-income countries, the bulk of the population is still in the rural sector.

Cross national and intertemporal data sets analyzed by Peter Timmer show that agricultural and rural growth has a far larger impact on poverty reduction than urban and manufacturing growth (Timmer 1997). The Timmer data also demonstrate that agriculture has little impact on poverty reduction in countries with highly skewed income and asset distribution, and that there is a few years lag in the full impact of agricultural growth in poverty reduction. Both of these relationships reinforce the conclusion that it is agricultural growth that dominates poverty reduction. It follows that in Indonesia the impact of the large-scale agricultural sector, e.g. large-scale palm oil production, has little impact on poverty reduction compared to the small landholders sectors. Rich landowners spend their incremental income on capital-intensive goods and imports, and have very little impact in rural communities.

The economic development process takes time for farm incomes to increase and to be spent on the rural non-farm sector, and for those recipients in turn to spend their higher incomes to feed into the process. There is a significant impact when the process takes place. Of direct relevance to Indonesia is the work by Martin Ravallion and his colleagues at the World Bank. They compared the impact of urban and manufacturing growth among different states in India. Their data indicates that urban and manufacturing growth has negligible impact on poverty reduction, while rural and agricultural growth has a robust impact (Datt and Ravallion 1998, Ravallion 1955).

2.2 Agricultural Prices, Poverty and Employment Growth

Agriculture has another different impact on poverty and employment. The poor spend 70 percent of their income on food, which includes 30 percent on cereals. Rapid agricultural growth lowers food prices, and hence has a major effect on the real incomes of the poor and contributes to a stable, low cost labor force. A few decades ago, this was seen as the dominant effect of agricultural growth on poverty reduction and employment growth (Mellor 1978).

The rapid increase in globalization, global market access, and global spread of technology has reduced the importance of the price effect of a specific countries agricultural growth. Since domestic agricultural prices are now less likely to depart from international prices. The emphasis relies on the labor-intensive rural non-farm sector to produce goods that are not traded internationally, and depend on local demand if they are to expand.

However, there is some remaining importance to the price issues in terms of cost of transportation. Even in a fully global world, food is expensive to transport which leads to a substantial difference in price between import parity and export parity. There is a substantial gap between the price in a country when the international price is paid plus transport costs (the case of imports) and the international price minus the cost of transport (the case of exports). For example, the difference in Indonesian domestic prices between exporting and importing rice is on the order of 20 percent. A 20 percent higher or lower rice price significantly affects farm incomes (higher

prices raise farm incomes), poverty, and employment growth substantially (higher prices increase poverty and reduce employment growth).

Imposing tariffs and quotas on imports of rice may deleteriously disconnect a country from the global markets. The most important aspect of these issues for poverty reduction and employment growth in Indonesia is the price of rice. At present the rice price is maintained at about 20 percent above the world price (Bappenas 2003). Export subsidies and overproduction of agricultural commodities in high-income countries make it difficult for low- and middle-income countries to argue about the deleterious impact of trade interference and barriers.

The artificial raising of the price of rice in Indonesia has three conflicting effects on poverty. First, it directly reduces the income of those at the poverty level, between 5 and 15 percent, by requiring more expenditure for a given quantity of rice (Pearson 1990). Second, it does increase incomes of rice farmers, some of whom fall below the poverty line. Third, the remaining farmers spend about half of their increased income on the rural non-farm sector, thereby increasing the wage rate and employment of the poor. There is evidence that the negative price effect outweighs the positive price effect. A more efficient policy in the long run is to incorporate measures that reduce the cost of production, such as increased physical infrastructure investment. Even more effective would be increased and targeted spending on rice research to increase yields, and to reduce the cost of production.

The 1998 financial crisis period in Indonesia tested these price relationships. When rice and many other food prices increased sharply due to large currency devaluations, carefully collected survey data for 1995 and 1999 revealed that income of various groups were affected quite differently (World Bank and CASR 2000) The income quintiles dominated by farmers experienced substantial increase, and were spent locally which resulted in large increases in employment for the lowest income quintile. However, the higher rice prices reduced the real incomes of these net buyers of rice. The negative effect of higher prices outweighed the positive effect of higher employment, and resulted in lower incomes of the lowest income quintile.

2.2.1 The Indonesian Record on Poverty Reduction

Indonesia has an extraordinary record of poverty reduction. Prior to 1976, poverty was steadily increasing and agriculture was growing slowly (Hart). Between 1976 and 1996, agricultural production grew rapidly (World Bank 2003). The percent of the rural population falling under the $1.00 per day poverty line declined by over two-thirds, from 40 percent to 12 percent (Asra 2000). Unfortunately, a reversal occurred between 1996-1998 (new series) when agriculture stagnated and rural poverty increased from 20 percent to 26 percent. From 1999 to 2001, the data fluctuated but did not follow a trend. These statistics are consistent with the previous exposition about the dominant role of agricultural growth in poverty reduction.

Table 2.1 Changes in Poverty Proportions, Indonesia, 1976-2001

Year	Rural Poverty %	Urban Poverty %	Total Poverty %
1976	40	39	40
1996	12	10	11
1996 (new definition)	20	14	18
1998	26	20	24
2000	25	10	18

Source: Central Bureau of Statistics as reported in World Bank 2003, Table 3

Urban poverty changes roughly parallel the rural changes except for 1998-2000. During that time, urban poverty dropped in half, while rural poverty stayed the same. The contrary experience in the urban sector is attributable to the substantial decline in rice prices from 1999-2001, clearly having a poverty reducing effect in urban areas. The story is ambiguous in rural areas, as it is favorable for the landless, but unfavorable for rice producers, many of who may also be poor.

Notable during that period of precipitous poverty decline associated with rapid agricultural growth, the distribution of income also improved, which is a generally rare occurrence in the early stages of development. As measured by the Gini coefficient, the distribution of income in rural Indonesia changed from 0.34 to 0.25 between 1978 and 1990 (Asra 2000). A declining Gini coefficient indicates an improving share of income to lower income people, and such a momentous drop is testimony to the powerful poverty reducing effects of agricultural growth. Taiwan, in its period of rapid agricultural growth, also experienced the rare phenomena of a decreasing (improving) Gini coefficient (Lee 1976).

During the period of rapid poverty decline, the real wage rate concurrently increased quickly (Asra 2000). Conversely, the real wage stopped rising at the same time that poverty began to increase. Both phenomena were associated with the rate of agricultural growth. While it was widely believed that there was considerable underemployment in rural Indonesia, the record on the real wage rate suggests that the problem of poverty was abysmal levels of employment productivity, rather than lack of employment. Through its direct and indirect effects, agricultural growth increased the productivity of employment, and hence, the real wage rate.

Elaborated further in a later section, the inverse relationship between agricultural growth and poverty reduction is partially nullified by population growth. Agricultural growth must be far more vigorous than population growth to stem continual poverty pressures. Recently, the period of stagnation results from agricultural growth only modestly above the population growth rate. Thus, lacking the thrust to overcome poverty pressures.

2.2.2 The Employment Problem in Indonesia

In order to lessen poverty levels below the previous lows reached in 1996, it is important that Indonesia return to rapid agricultural growth. Complete poverty

eradication is an insurmountable task for agriculture alone, since there are relatively disadvantaged people and regions that will characterize the remaining poverty. However, only a few more years of vigorous agricultural growth will bring the poverty levels down to the minimal threshold. If agricultural growth stagnates while urban industrialization continues, the problem becomes one of widening disparities in rural/urban income ratios. To prevent such widening of rural/urban differentials, and subsequent social and political conflicts, rapid employment growth in the rural non-farm sector is necessary. Rising agricultural incomes provide the effective demand for that sector, thereby reinforcing the employment growth and constraining the growth in rural/urban income disparities.

As long as the rural population is on the order of three times the size of the urban population, urban employment will have to grow at three times the population growth rate in order to absorb all the population growth productively (Johnston and Mellor 1960). The projections are daunting at this stage of development. With major improvements in policy, institutions, investments, and private sector agribusiness, a synergistic relationship can mutually benefit the urban and rural populations. A rise in urban per capita income leads to greater demand for livestock and horticultural products. These demands are labor intensive and profitable, thus contributing to higher rural employment levels and higher agricultural incomes.

When the process of development is outlined, the daunting projections of overcoming the income gap can feasibly be achieved. The major focus must be on the key problems of accelerating agricultural growth, which neither the Government of Indonesia nor the donor community prioritizes in their development plan. In particular, donor effort has focused on direct means of poverty reduction. This strategy is inefficient and has minor aggregate impact, as compared to the powerful indirect forces of agricultural growth. In the alternate scenario of greater income disparities attributed to low unemployment and low wage rates may include social and economic unrest.

2.2.3 Data on Employment and GDP Composition

Table 2.2 provides estimates of the share of employment and GDP by sub-sector. Sixty two percent of the population/labor force is in the rural sector, and 38 percent in the urban sector. Official statistics indicate that 44 percent of the population/labor force is concentrated in agriculture, which leaves the remaining 18 percent in the rural non-farm sector.

Table 2.2 Estimated Share of Base Employment, GDP, by Sub-sector, Pre-Crisis Year, Nominally 1996

Sub-sector	Share Employment. Assuming full employment in agriculture.	Share GDP	Share Employment, Official Statistics
Rural	**62**	**30**	**62**
• Agriculture	(30)	(15)	(44)
• Rural Non-farm	(32)	(15)	(18)
Urban	**38**	**70**	**38**
TOTAL	**100**	**100**	**100**

Source: Extrapolated by the author from BLS statistics

In term of full time equivalents, it is doubtful if more than 30 percent of the labor force works in agriculture. The statistics are called into question because 45 percent of the rural population has no land, which may include agricultural laborers, and 20 percent of those with land have less than 0.25 hectares, which typically provides less than half the poverty level income (Bappenas 2003). For those families, survival requires rural non-farm income to exceed farm income.

The difference between the 44 and the 30 percent,, can be classified as either underemployed or deriving income from the rural non-farm sector, while nominally reporting working in agriculture. Since the rural real wage increased during periods of poverty reduction, it is implausible that a substantial proportion of the rural population is unemployed. Dividing the rural labor force roughly equally between agriculture and the rural non-farm sector, is consistent with other countries with a similar proportion of GDP in agriculture, e.g. Egypt (Mellor and Gavian 2001).

Of notable distinction is when agriculture grows rapidly through technological change, contributing to a substantial labor productivity rise. However, labor productivity in the rural non-farm sector tends to stay constant with a high level of labor intensity. The distinction becomes less important if a large proportion of incremental growth shifts to high value and labor-intensive commodities such as horticulture, livestock and fisheries.

Under favorable, high growth conditions, the urban sector will expand considerably faster than agriculture. The next section demonstrates how a fast 4 percent agricultural growth rate might be achieved, with three-quarters of incremental output sourced from the labor-intensive parts of agriculture. With that agricultural growth rate, a rapid 8 percent growth rate in the urban sector, and the proportion of employment in the rural sector as shown in Table 1, it follows that half of employment growth will be in the rural sector. Of the rural share, well over half would be in the rural non-farm sector. These statistics signal economic transformation with the share of agriculture declining fairly rapidly. However, the

non-farm population is defusing substantially through rural small towns rather than being concentrated in a few dominant large cities.

2.3 The Commodity Composition of High Agricultural Growth Rates

The preceding sections have shown the importance and intrinsic relationship of agricultural growth, employment growth, and rural/urban income disparities. Since rising farm incomes fuel the employment growth, agricultural production must expand significantly per capita. Fast growth middle-income countries experience agricultural growth rates between 4 and 6 percent, so a 4 percent growth rate should be a realistic target for Indonesia (Mellor 1995). From the perspective of income stimulus to the rural non-farm sector, the per capita rate is critical. The average agricultural growth rate for 1991-2000 was 2.3 percent, or 0.6 percent per capita. A 4 percent growth rate provides 2.4 percent per capita. The targeted 4 percent rate, while only 75 percent faster than the rate in the stagnant 1990s, provides a per capita rate four times as high.

Table 2.3 provides an indicative commodity composition of different growth rates under various parameters. The table also shows an indicative composition of a 5 percent rate that could be achieved, if everything is administered correctly as prescribed, and similarly for a 3 percent rate that represents the best that can be expected with no changes in policies, investment patterns and institutions.

Table 2.3 Indicative Compositions of Agricultural Growth Rates of 5%, 4%, And 3%

Commodity group	Base Proportion of output	Growth rate	Prop. Of growth	Growth rate	Prop. Of growth	Growth rate	Prop of growth
		5 % Scenario		4% Scenario		3 % Scenario	
Rice	26	2.5	13	1.5	10	1.5	13
Estate crops	17	6.0	21	6.0	26	4.0	22
Horticulture	15	8.0	24	6.0	23	4.0	20
Livestock	11	8.0	18	6.0	17	4.0	14.5
Fisheries	11	6.0	13	5.0	12	4.0	14.5
Other Food	9	2.5	4.5	2.0	5	2.0	6
Maize	2	5.0	2	5.0	2	4.0	3
Forestry	9	2.5	4.5	2.5	5	2.5	7
TOTAL/ WEIGTED AVERAGE	100	5.0	100	4.0	100	3.0	100

Source: Calculated by the author from data from other countries with similar growth rates and Indonesian experience in the various sub-sectors.

Four high growth, high value sectors determine the growth rate of Indonesia's agriculture since they account for nearly 80 percent of incremental growth. With 4 percent growth, horticulture and livestock increase about roughly 6 percent rate of domestic demand. Income elasticities of somewhat over 1 are assumed with per capita income growing at about 5 percent. Fisheries growth is estimated conservatively at 5 percent, which is less than in the recent past, assuming that it has lower income elasticity of demand than for livestock and horticulture. The estate crops have been growing at a 6 percent rate, there is ample land available for these crops and a substantial proportion of a high output growth rate can come from the small landholders estate crop sector. Placed at a 6 percent growth rate that accounts for 21 percent of incremental growth. These are all demand led estimates. Later sections are concerned with what is needed to achieve production and marketing growth of these magnitudes. When there is demand, production systems will respond if it is profitable. The later sections show that profitability.

Table 2.3 presents indicative composition for the best-case scenario of 5 percent growth rate, but the composition of the growth is similar. The main differences are increasing the rice growth rate by a percentage point, based on substantial research application and faster growth in horticulture and livestock. In addition, providing substantial growth in exports (horticulture) and import displacement (livestock) should be a priority.

The table also presents composition for a slow growth rate of 3 percent, which would have little impact on poverty reduction. It is notable that the four high value sub-sectors still dominate incremental growth, emphasizing the point that if those sectors do not grow rapidly, poverty is likely to increase rather than decrease.

The World Bank (1992) has estimated substantially lower income elasticities of demand, but yet projected demand growth at nearly 6 percent for livestock and 5 percent for horticulture. The estimates seem excessively conservative elasticities for a country with such low base levels of consumption. With these assumptions, horticulture and livestock account for nearly half of the incremental growth, and these two commodity sets plus fisheries account for well over half of the incremental growth.

Rice lags beyond present estimates of domestic demand at a 1.5 percent growth rate (Pearson 1996), but is ahead of the expected rate of growth of demand in the next decade. Corn is shown at a rapid growth rate on the basis of effective demand for livestock feed. Even though rice is assumed to grow fairly slowly, its heavy initial weight still allows it to account for 10 percent of incremental growth. These 5 sub-sectors (high value commodities plus rice) account for nearly 90 percent of incremental growth.

Rice production growth is dependent upon progress in agricultural research, since area expansion (except from sugar) would create slow growth in the high value commodities, which have the greatest potential for growth. In fact, the World Bank (1992) projections for rice consumption slow to 1.4 percent over the next decade, which is based on higher than normal income elasticities of demand. Thus, the 1.4

percent growth is istle an overstatement of future growth in demand. Within that scenario, it would be desirable to shift area from rice into livestock feed, and to capitalize on a faster growth rate in maize and other livestock feed crops.

2.3.1 Agribusiness Implications of a Fast Growth Path

Accounting for 2/3 to 4/5 of incremental growth, horticulture, livestock, fisheries, and estate crops, all characterize the importance of non-traditional agribusiness. Three in this set have further characteristic of being perishable commodities, so that special demands fall on the agribusiness sector. In an agricultural growth, employment oriented strategy, the ability to achieve a high growth rate in agriculture in the future hinges heavily on development and rapid expansion of non-traditional agribusiness activities.

Production for the domestic market is an integral component of a high growth strategy. Supermarkets that are increasingly demanding high volume and high quality will progressively dominate the domestic market for both horticulture and livestock. Concurrently, poverty reduction requires rapid growth in the small landholders sector , which competes effectively with large farms in production costs but have difficulty in meeting the volume and quality requirements of supermarkets. Development of the agribusiness sectors for these commodities must give special attention to how small farmers can be organized to meet new requirements.

2.3.2 Technological Implications of a Fast Growth Path

The continuing trend towards global competition and the accelerating pace of new science and technology applications require prompt scientific advancements, even for the domestic market. An indicative set of targets for achieving rapid agricultural growth must in turn set the scientific priorities. In the modern global world, no sub-sector of agriculture can survive without rapid technological change and the science system to ensure change. Some of that applied science will come from the private sector, yet attention must be given to ensure that the private sector is accomplishing the job. There are necessary public conditions such as the provision of complementary public facilities to correspond with private sector needs.

2.3.3 Policy Implications of a Fast Growth Path

Three particularly important areas for policy in achieving a high agricultural growth rate are as follows. First, price policy should favor the shift of low intensity cereals, roots, and tubers towards high value crops such as horticulture, livestock feed, and small landholders estate crops. Second, small farmers need considerable assistance in adapting production of high value, perishable commodities to standards of supermarkets and exports in terms of volume and quality. Third, a plan for massive and continuous improvement in the rural physical infrastructure is needed. The current infrastructure is inadequate with 70 percent of the total road length in Indonesia at the Kabupatan level, and 70 percent of the roads at that level are in poor condition.

2.3.4 Regional Differences in the Employment Problem

Rural poverty is dispersed throughout Indonesia, but is mostly concentrated in the high-density areas of rural Java and Bali. The solutions to poverty and employment growth are the same in all regions – accelerated agricultural growth. However, the commodity composition of that growth differs among regions. For the majority of the outer Islands, small landholders commercial production of estate crops will be most important. For areas of northern Sumatra, the potential for traditional horticultural exports is significant. Areas with potential for maize can increase livestock production. To realize these advantages, internal and external trade barriers must be removed and inter island transport costs must be reduced by investment and increasing competition.

2.4 Agricultural Growth, Poverty, Biodiversity and The Environment

Indonesia is home to immense biodiversity that is of importance to itself and is also seen by many as an important global treasure. The relationship between agricultural growth, poverty reduction and biodiversity is both complex and important (Mellor 2002). As is clearly shown in the preceding analysis and presentation of statistical analyses, poverty reduction and rapid employment growth in low and middle-income countries are largely dependent on a high agricultural growth rate. Without increased rural employment and poverty reduction it will be impossible to prevent incursions into areas that need to be preserved for biodiversity. Thus, there is an important relation between agricultural growth and biodiversity. The complexity occurs within that relationship.

Agricultural growth and consequent poverty reduction makes it possible for rural people to be supported with a smaller amount of land and thus reduces the necessity of moving into areas of critical biodiversity. However, there is a divergence between areas of low productivity and high productivity agricultural resources. In the former, the technological change associated with high agricultural growth rates will work to reduce land values Mellor 2002). The cost of acquiring land for biodiversity preserves will decline, and implicitly the cost of protecting that land will decrease. However, those same technological forces will increase the productivity of the best land, most responsive to modern technology. That land will increase in value and the returns to taking such land from biodiversity preserves will increase and implicitly the cost of protecting it will increase. A similar divergence occurs with respect to land suitable to or alternatively not suitable to expanding production of high value crops.

Thus, as one contemplates the effect of rapid technological improvement in agriculture there is urgency to acquiring and protecting land that will increase in value with modernization. Conversely land that will decrease in value can be differed in acquisition programs.

The conclusion is that improved technology is essential to relieving pressure on biodiversity, but that in the case of the more productive and responsive resource there is urgency to increasing the area of biodiversity preserves and providing protection.

On a quite different aspect of the biodiversity problem, the thrust of the argument for agricultural growth as the principal means of reducing poverty and increasing employment revolves around the key role of small commercial farmers who live and spend in the rural community. That places the emphasis on poverty reduction and employment growth on expanding incomes of commercial small farmers. Invading areas of biodiversity for commercial small landholders estate crop production does have a trade off between rural employment growth and biodiversity. That tradeoff is far less powerful in its employment component with respect to large-scale estate agriculture.

Thus, in Indonesia, the conflict between biodiversity and agriculture related particularly to the areas for small landholders estate crops. The large estates do little for poverty reduction and conflict with biodiversity. The small landholders assist in for poverty reduction, providing a genuine conflict with biodiversity. This is a critical issue that requires staking out the biodiversity areas, simultaneously, as small landholders estate crops are encouraged in other areas.

2.5 Conclusion

The bulk of the solution to the interrelated and immense problems of inadequate employment growth, poverty, and rural/urban income disparities lies with accelerated agricultural growth. It is the indirect effects of that growth, through its income multipliers to growth and employment in the rural non-farm sector that will bring solution to those difficult problems.

Rapid agricultural growth requires: (1) continuous improvement in rural physical infrastructure, an emphasis that has lagged in the last decade or two; (2) rapid science based technological change in agriculture, another area that has been lagging in recent decades; (3) a commodity emphasis, in the context of rapid overall growth, on the horticulture, livestock and fisheries, and estate crops as the commodity groups that will contribute the bulk of income growth; (4) within the commodity priorities the emphasis must be on the small commercial farmers, with attendant problems of achieving commercial volume and quality, and need for special attention from the agribusiness sector; (5) following the preceding commodities in priority would be rice, but the interests of growth are best served by increasing incomes in rice farming through major increases in yields through improved technology, thereby decreasing the area needed under rice and releasing land for higher value commodities; (6) although of much lower importance than the other commodity groups increased productivity, lower costs, and lower prices for maize would greatly facilitate rapid expansion of commercial small-holder livestock.

The high value commodities require rapid expansion of modern agribusinesses, which are currently only a fraction of the numbers, size and efficiency required. Key policy reforms and world-class research are needed, particularly in the global business environment. The opportunities for commercial small landholders agriculture are distributed broadly in Indonesia, and roughly commensurate with the distribution of the rural population.

Chapter 3

THE STATE OF AGRICULTURE

The course of agricultural growth and farm incomes in Indonesia has been uneven. The decline in poverty has also been uneven but extraordinarily large. The timing of changes in the rate of poverty decline has been co terminal with the pace of agricultural growth. The immense poverty decline is all the more striking because Indonesia was long seen as the classic case of massive rural poverty with no hope for removing it.

Agriculture was the ray of sunshine when the Asian monetary crisis hit Indonesia in 1997. Agriculture benefited from the exchange rate devaluation and rural incomes and employment were maintained. However, agricultural growth based on price increases rather than productivity increases is a mixed bag for the rural poor – they gain in employment, a few gain increased income from higher sale prices, but many more lose from the higher price of food. In net the rural poor were losers in that period. The lesson is the preferred means of achieving high growth rates in agriculture is through productivity increasing technological change and response to market forces favoring high value commodities rather than increased prices. This report dwells on that point throughout.

Agriculture has also filled its classic role of supporting the economic transformation. Its relative importance, as a share of GDP, has declined substantially, with the sharpest decline in the periods of most rapid agricultural growth. The latter is of course the classic pattern reflecting the importance of increased agricultural productivity in supporting the economic transformation.

The relative (but of course not absolute) decline of agriculture had its cost in increased urban bias in development actions on the part of both foreign aid donors and the Government of Indonesia. The result was reduced emphasis on agriculture, a slowing of the agricultural growth rate, and greatly slowed growth in employment. In that context little attention was given to the radical change in sources of rapid agricultural growth and new requirements of policy, institutional development, and investment.

There is much to be done to get agriculture and employment growth back on track and it will take time. This report states the key components for that turn around and emphasizes the immense benefits to rural stability, employment growth and poverty reduction, decentralization, demand for education, and regional equity.

3.1 Declining Share of Agriculture in Economic Development

Agricultures share of GDP has declined rapidly. The most rapid decline has been in the periods of most rpaid agricultural growth, spotlighting the key role of agricultural productivity growth in achieving rpaid economic transformation. Agriculture speeds

transformation of the economy by providing rapidly growing demand for the most employment intensive parts of the economy that for reasons of quality and high transaction costs cannot find foreign markets. Agriculture also releases resources to other sectors as its resource productivity increases.

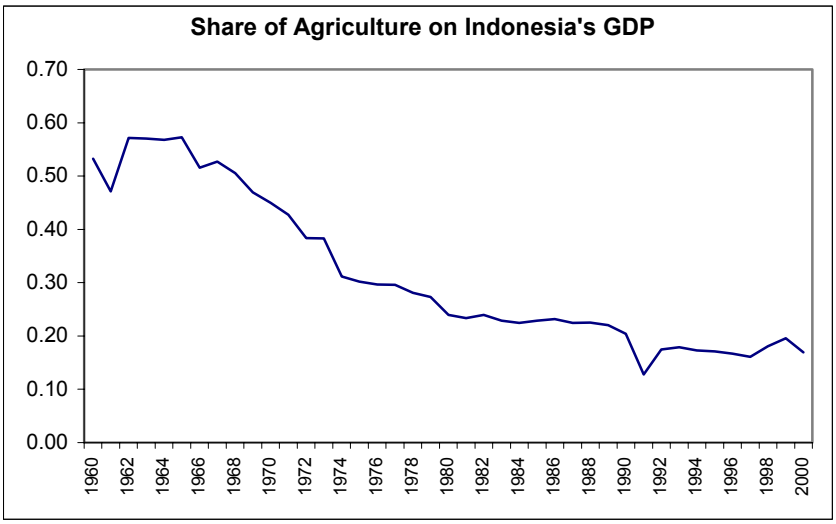
Rapid increase in agricultural productivity induces a broad geographic spread of urbanization and non-farm growth that is environmentally and socially much healthier than the urban concentrations associated with purely export led growth. Of course rpaid agricultural growth itself depends importantly on foreign markets and exports, supportive government policy, rapid development of new institutional structures, prioritized investment in research to development new technologies, and massive investment in physical infrastructure.

The success in agriculture and the consequent diminished interest by foreign aid donors and the government of Indonesia has resulted in sub-optimal investment in agriculture and biases towards industry that have distorted the structure of industrial growth and thereby reduced resource productivity and competitiveness in that sector. It is important to understand the forces at work in agricultures relative decline, and that relative decline occurs most rapidly when absolute growth in fastest if appropriate agricultural and industrial policies are to be implemented and so past misinterpretations of what is happening and consequent bad policy are not to be reputed.

Data on Indonesian agriculture show a declining share in the GDP, from over 55 percent in the 1960s to about 25 percent in the 1980s, and about 17 percent in 2000 and beyond (Figure 3.1).

The declining share of agriculture in the Indonesian economy is also “consistent” with the increasing share of industry and service sectors in the economy. These sectors contribute to about 33 and 36 percent, respectively in the 1970s, rising to 40 percent and 47 percent, respectively in 2000 and beyond. A similar tendency occurs in the share of employment, trade, and consumption on the GDP.

Figure 3.1. Share of Agriculture on Indonesia's GDP, 1960-2001



In the literature, the declining share of agriculture in economic development is usually explained more formally by the following factors: changing relative prices, differential rates of technological change, and changing relative factors supplies.

First, the traditional, demand-side explanation of such a decline is associated with the classic Engle's law. A less-than-unitary income elasticity for agricultural products implies that gross value of sales by farmers will grow less rapidly than gross domestic product in the whole economy. As a country develops or as per-capita income rises, expenditure shifts toward services and manufactured goods relative to food. In a closed economy, the preference shift causes the relative price of food to decline, all other things being equal. If agricultural output fails to grow rapidly enough, rising prices might actually gather farmers a higher share of economic expenditures. Other things equal, if the terms of trade do not rise in favor of agriculture, farm productivity must also rise.

The second explanation on the declining share of agriculture is based on Chenery's principle suggesting that the structural transformation, measured by output per labor or output per hectare is much higher in developed countries. In addition, differences in technical change rates between sectors affect the composition of aggregate output according to the differential rates of factor endowment growth. Technological change in agriculture has proceeded at such a pace that the long-run terms of trade decline for agricultural products. According to Timmer (1993), the combination between low-income elasticity and productivity differences in agricultural sector has put pressure on agricultural resources to shift away from farming and into the more rapidly growing sectors of the economy. This "push-effect" could imply painful intersect oral movements of resources, which influence the outcome of structural transformation in the economy.

The third explanation is based on Rybczynski's effects, which states that in a two-sector, two-good economy, an increase in the total supply of capital relative to labor

will influence the output mix, for given product prices and technology. A small rise in the capital-labor ratio will increase the output of the relatively capital-intensive good, and reduce the output of the relatively labor-intensive good. Using a set of empirical data from Indonesia and Thailand, Martin and Warr (1993, 1994) suggest that changes in these factor endowments are dominant in explaining the relative decline of agriculture in the economy.

More recently, Punyasavatsut and Coxhead (2002) offer a more policy perspective explanation, suggesting that agricultural decline is generated by policies rather than by fundamental preference or endowment shifts. The empirical evidence from Thai structural change in the last five decades suggests that government policy is not neutral, implying that by taxing agriculture, development policy accelerates the decline of agriculture. During the early development period, effective agricultural taxes are important "push" factors for the decline, but elimination of these taxes can be a powerful instrument in slowing agricultural decline. Even though the direction and strength of policy effects varies over time, the nature and the quality of policies that contribute to sectoral resource allocation, migration, and urbanization may have a significant impact on long-run welfare in developing countries.

The combination between "push-factor", due to improving productivity in the agricultural sector, and "pull-factor", due to higher economic opportunity in the industrial sector, has transferred resources from both finance and labor to industrial and service sectors. Financial flows can be in the forms of rural savings to urban investments, and transfer of income through price policy and industrial protection. In the literature, integrating agriculture into the economy could imply a declining share of food in urban budgets. The share of farm-gate price of commodity in the consumer's market basket declines because of increasing processing and marketing costs. Commodity price supports may become a "rational choice" despite distorting effects of high-level agricultural protection on resource allocation (Timmer, 1988).

Meanwhile, the promotion of industrial development in Indonesia since the mid-1980s has been under heavy protection at the expense of agricultural sector growth. The government has controlled the price and trade of selected products, not to mention the political economic arguments of uneven access to resources and economic opportunities. In the absence of formal rules of laws, *dirigisme* microeconomic policies in favor of certain groups of economic actors in trade and industrial policies, and an informal mechanism between economic and political fates, have contributed to the secured property rights among economic actors and political elites (see Rock, 1999).

More importantly, the protection and intervention regime in industrial promotion has caused regional income disparities and drew greater demand for decentralization and regional autonomy. Several empirical studies confirm that these intervention regimes have favored Java and taxed non-Java provinces, and the manufacturing protection have accounted for more than 10 times as much as protection on agriculture and forestry (Garcia-Garcia, 2000). Given regional disparities in Indonesia, promoting manufacturing sectors through unbalanced growth has serious

regressive effects, where the economic transfers flow from the poorer region to richer regions. Such types of development patterns and policy bias in the manufacturing sectors, hence urban sectors, have caused losses to the outer islands and stifled their development.

Thus relative decline in agriculture, even while it grows in absolute terms is desirable and a sign of progress. But artificially speeding that process through neglect of agriculture by donors and government and by artificially funneling resources to suburban industry slow overall growth and has unfortunate interpersonal and interregional equity implications.

3.2 Phases of Agricultural Development

Indonesia's agricultural growth record is usefully divided into six quite different phases. That division spotlights the changing role of agriculture in employment growth and poverty reduction, the changing sources of growth, and the changing needs for future investment, institutional development, and policy.

Most striking is the focus of government on ensuring a rice revolution and to some extent a maize revolution that drove very high growth rates when radically improved technology became available. Equally striking is the current need for a quite different approach to the agricultural sector.

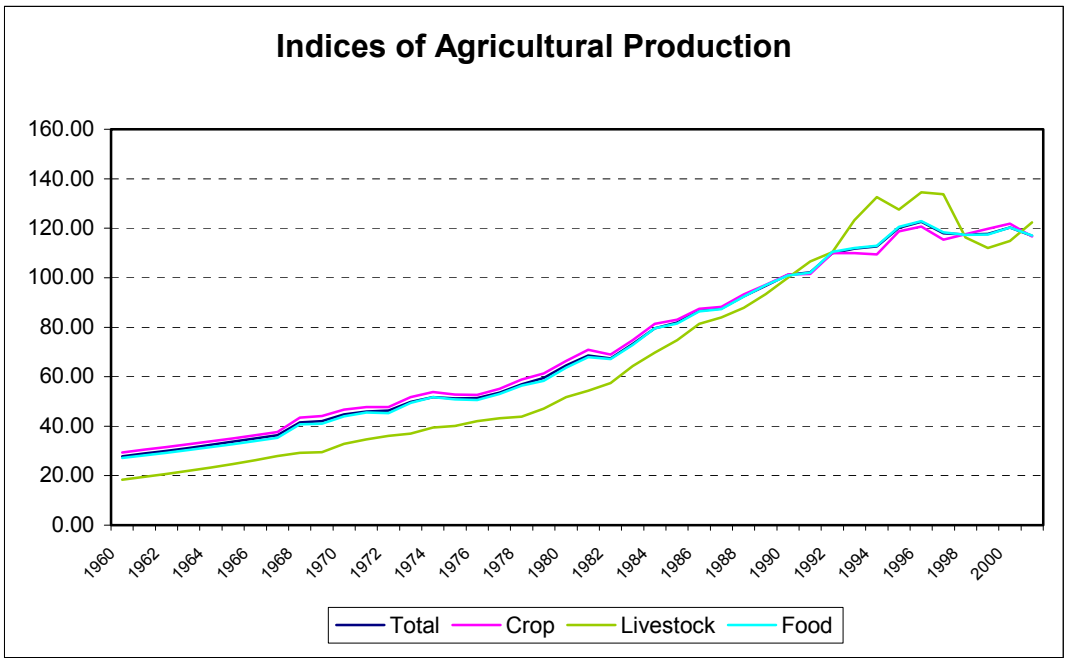
This section examines the growth performance within the agricultural sector, focusing primarily on forces contributing to the patterns of agricultural growth in the country. The expansion of agricultural production in Indonesia has experienced a rapid and steady growth since the early 1970s up to mid-1980s, partly as a result of expansion in resource endowments and increased yield brought about by advances in production technology. A tremendous increase in the level of intensive land-use system is also associated with the spread of new seed varieties and chemical fertilizer. These bio-chemical inputs have significantly shaped the growth patterns of Indonesian agriculture.

In terms of agricultural production, the average rate of growth from 1960 to 2000 is 3.73 percent per year, but that hides the large differences in sub-periods. In the 1960s when new technology was not available, the growth rate was very low. Early initiatives to intensify agricultural practices contributed to high growth in the 1970s. When movements on land use intensification, area expansion, and crop diversification amplified and spread widely across the country, Indonesia experienced a successful self-sufficient level in rice production in the mid-1980s. However, this high growth rate did not persist in the 1990s due to non-conducive policy environments, and the slow pace of research, technological progress, and agribusiness systems.

Indonesian agriculture has not significantly increased rice yields since the early 1990s. Structural and institutional problems with estate crops, droughts in 1987/88 and 1992/1993, and pest incidents in major production centers caused growth to slow

in the period before the peak of the 1998 economic crisis. More importantly, deterioration of important infrastructure (e.g. irrigation, roads, bridges, ports, etc) in several places of the country exacerbated the decline in agricultural growth. When research systems and technological progress cannot improve the rice yield required to maintain the necessary growth rates, and when public expenditure on agricultural development dropped significantly in the 1990s, the performance of Indonesian agriculture plummeted. The slow down in growth and leveling-off in agricultural production continued until the early period of the 1998 economic crisis. During the crisis period, the agricultural sector temporarily recovered due to great devaluation of the Indonesian currency, from the high output prices of some estate and cash crops, fisheries, and other high value crops.

Figure 3.2. Indices of Indonesia's Agricultural Production



During the crisis, the agricultural sector has been the only sector experiencing a positive growth rate – although very small– and performing relatively better than all other sectors in the economy. For a short period of time, the agricultural sector and rural economy was able to absorb the flow of labor from the industrial and service sectors. However, when the labor movement between agriculture and industry, or between the rural and urban economies could not fully be absorbed, agriculture experienced serious difficulties in maintaining the growth performance. Therefore, the agricultural sector could not achieve the high expectations of significant economic recovery, and will continue to face serious problems in the years to come.

Agricultural gross domestic product (GDP) at constant price of 1993 based data is obtained from publication of Central Agency of Statistics (Badan Pusat Statistik =

BPS), measured in billion Rupiah. Agricultural GDP is an aggregate of five important sub-sectors: food crops (including horticulture), estate crops, livestock and its products, forestry, and fisheries. The forestry sub-sector is excluded from the calculation because it largely involves large private concessionaire companies rather than small-scale farmers.

The data used for this exercise was collected from a wide range of secondary sources. Data on agricultural labor is proxied from "economically active population in agriculture", obtained from the publications of the United Nations Food and Agricultural Organization (FAOSTAT). Agricultural production is obtained from the FAOSTAT agricultural production index, an aggregation of food crops, estate crops and livestock (fisheries production is excluded). Data on land area is measured as arable land, consistent with FAOSTAT. Note that arable land in the statistics consists of lowland paddy fields and upland annual crop lands, which might not include forest and pastures. Productivity indicators are measured by the ratio of agricultural production to labor force (labor productivity), and the ratio of agricultural production to arable land (land productivity or yield).

Table 3.1 Deconstruction of Agricultural Growth Performance (percent per year)

Itemized	**Consolidation** 1967-78	**Rapid Growth** 1978-86	**Deconstruction** 1986-97	**Crisis years** 1997-00
1. Agricultural GDP	3.39	5.72	3.38	1.57
➢ Food Crops	3.58	4.95	1.90	1.62
➢ Estate Crops	4.53	5.85	6.23	1.29
➢ Livestock	2.02	6.99	5.78	-1.92
➢ Fisheries	3.44	5.15	5.36	5.45
2. Agricultural Production	3.57	6.76	3.99	-0.47
➢ Labor Productivity	2.08	4.13	1.83	-1.45
➢ Land Productivity	2.32	5.57	2.03	-0.47

Sources: Calculated from BPS and FAO

Phase 1, "Periods of Struggle", which runs up to 1967 is a period of stagnation in agricultural growth, despite the seeds of early mass-guidance were planted during this period. Phase 2 is from 1967 to 1978, and characterizes the New Order Government led by President Soeharto trying to improve economic and political consolidation. The government first announced devaluation of Indonesian currency with the intention to promote export of non-oil commodities in 1978. Phase 3 represents the period of rapid growth of 1978-1986 when Indonesia achieved self-sufficiency level in rice production. In 1986, deregulation and devaluation signified a major shift in priorities and strategies for economic development. Phase 4 encompasses the deconstruction of agricultural growth because an unbalanced development paradigm between industry and agriculture. Phase 5 represents the financial crisis period (1997-2000) where several political and economic events came

to a head, but agriculture could not benefit from the significant comparative advantage in natural resource endowments. Finally, Phase 6, explains the recent economic development during political transition and decentralization.

3.2.1 Before 1967: Periods of Struggle

Agricultural production in general was simply aimed at meeting subsistence need, where simple production methods, largely based on traditional technology with limited support of research system. Major agricultural policy in this phase was primarily to achieve national food security by increasing food production and nationalization of former Dutch plantation companies for foreign reserves. Green Revolution technology enters Indonesia in the early 1960s, when the institutional set-up was somehow initiated in the society, primarily in Java. Some group of students from Bogor Agricultural University (IPB), then College of Agriculture of the University of Indonesia, developed and disseminated new technologies in agricultural production. These students, helped by some senior professors have established and implemented the very famous mass guidance (BIMAS) policies to give guidance to farmers in adopting the use of new techniques of agricultural practices. The policies later develop into mass intensification (INMAS) policies, where increase in food production can be achieved by increasing the level of intensification in any given of land.

The policies fit very well with the "populist approach" of President Soekarno administration, which have initiated transmigration program to distribute population and economic activities more equally across the archipelago. In later developments, BIMAS and INMAS to improve food production and maintain food security is the involvement of banking sector to provide farmers access on credit markets at a rate of 12 percent per year, which is about market interest rate, together with package of technical assistance and bio-chemical technology. Rural banks (and some rural cooperatives) were implementing the application of subsidized credit and input uses.

However, in 1965 the first economic recession and political chaos hit the country and Indonesia has experienced over a 500-percent inflation-rate. Prices of food and foodstuffs were exceptionally high, budget deficit increased up to 100 percent, and unemployment level grew very rapidly. Many writers have argued that this recession was brought about by ever-increasing economic mismanagement, where President Soekarno has tried to implement "guided democracy" and its corollary "guided economy" as major policies in economic development, not to mention the adoption of Indonesian version of socialism. The country was literally bankrupt, unable to meet payments due to foreign debt. In these difficult years, export earnings had fallen to a level where they were barely sufficient to finance half of the countries minimum requirements, excluding debt service.

The statistics and data quality were very poor, so that almost no advanced economic analysis had been made to examine the first economic recession. What people remember very well is that there was attempted *coup d' etat* on September 30 of 1965, an Army General Sohearto then came to power to become the president,

members of communist parties were killed and jailed, political chaos were inevitable and President Soekarno served a house arrest until his death. At the end of 1960s, the Indonesian economy made an important shift towards a more modernized path, where the use of monetary measures has gained popularity. President Soeharto administration officially integrates agricultural development into the mainstream Five-Year Development Planning (Pelita) and economic orientation of development policies, which then marked the progress of the Indonesian economy into modern era.

3.2.2 Phase 2: 1967 – 1978 Consolidation Period

In this phase, government policies were consolidated to restore the confidence in the economy and social order and agriculture played important roles in shaping the patterns of development and policy strategies to achieve economic development. Since then, agriculture was seen as the prime mover of rural development and important contributor of economic development. In the First Five-Year Development Plan (*Pelita*) initiated in the beginning of fiscal year in April of 1969, agricultural sector was put as the basis of economic development. The share of agriculture in the structure of economy accounts of more than 40 percent, while the share of labor absorption accounts more than 55 percent of overall labor absorption in the country. The progress in fertilizer technology and high-yielding varieties is also seen as the major engine of growth in agriculture.

Gross Domestic Product (GDP) of agriculture grew at a rate of 3.39 percent per year, primarily because of good performance of food crops and some estate crops, which grew at 3.58 and 4.53 percent per year, respectively. Low initial base and some results of rice intensification programs played important roles in setting the growth momentum. Rice production in 1970s reached over 2 million ton and the yield or land productivity was above 2.5 ton per hectare, about double the figures in the mid 1963. The increase in agricultural production and productivity in the 1970s can be associated with three important policies in agricultural development: (1) intensification, (2) extensification and (3) diversification. Intensification refers to any efforts to increase land productivity per hectare, which implies the use of bio-chemical technology in any given of land. The term extensification refers to the land expansion by converting forestland and other uses to agricultural land. Diversification refers to efforts to spread the agricultural risks and economic opportunities into several crops or farm activities. Transmigration policies to distribute population from Java to outer island could meet criteria for intensification and extensification, and probably diversification.

Land-use intensity has increased production and the yield, as the results of mass intensification (BIMAS and INMAS) policies consistently enforced by the government. Improvement of these policies to improve irrigation infrastructures is known as special intensification (INSUS) and special operation (OPSUS) in some remote areas. These intensification policies represent technological change in agriculture, where the use of high-yielding varieties, chemical fertilizer and pesticides which significantly increased land productivity. More specifically,

improvement of irrigated land stimulates the intensity of agricultural land use and increases the yields per harvested area. The achievement in the 1970s has established a very important foundation for high rate of agricultural growth in 1980s, where institutional arrangements of farmers' group, water user associations, and other society organizations performed quite well, primarily in Java.

3.2.3 Phase 3: 1978-1986 Rapid Agricultural Growth

In the period of 1978-1986, agricultural GDP grew at over 5.7 percent per year, also because all sub-sectors experienced favorable environment to develop very rapidly, as the government focused on putting agricultural sector as a main basis for economic development. A remarkable 6.8 percent increase in production and productivity in food crop, estate crops, livestock and fisheries has really shaped to patterns of high growth in agriculture. Part of this growth is brought about by a 5.6 growth in yield due to Green Revolution technology in rural areas, which offset the declining land-labor ratio. More importantly, agricultural production per labor or labor productivity in this sector also increased at 4.1 percent per year. That rapidly increased farm incomes and provided the basis for a demand stimulus to the rural non-farm sector.

In the words of Hayami-Ruttan (1985), production constraints imposed by unfavorable resource endowments in backward regions is offset by combined introduction and spread of new bio-chemical inputs and investment in land infrastructure. Agricultural development in Indonesia is in parallel to the promotion and distribution of input packages including seeds, fertilizer, pesticides, affordable credit, and technical information and guidance. These have contributed to technological progress to stimulate agricultural growth, particularly to sustain food production in the country. As a result of these long-term efforts, Indonesia has achieved self-sufficiency level in food production. During the 1985 World Food Summit of the Food and Agricultural Organization (FAO) of the United Nations, President Soeharto received an award of being successful in transforming the status of biggest food importer in the world into a country with self-sufficiency.

More importantly, achievement of self-sufficiency in food production is also complemented by greater level of equality among rice farmers, and between rural and urban areas. As similar tendencies also found in villages across Asian rice producing economies, the literature often make conclusion that Green Revolution has contributed to greater equality. Induced innovation in new techniques and new institutions of agricultural technology continued to happen as patterns of interactions between wage laborers and landlords also change with the dynamics of society. However, the progress of Green Revolution technology does not come without criticism, such as inception of new dependency between laborers and landlords, between farmers and bio-chemical companies, and between developing countries and developed countries. These new techniques have eroded social relationship among farmers in the villages because the argument of economic efficiency has replaced the basis of social cooperation under more patron-client relationship between small-scale and large-scale producers.

The high growth in agriculture has complemented the industrial progress, which was seen as a necessary and sufficient condition for structural transformation of the Indonesian economy. Until the mid 1980s, modernized strategy of economic growth and expansion of more productive economic development has continued, as the growth has recorded a very high rate of over 7 percent per year. More importantly, macro policy to achieve structural transformation of the economy has been successfully implemented, where Indonesia has shifted oil-and-gas export dependence to non-traditional exports such as plywood, rubber, coffee, copra, fisheries, etc. Many efforts have been put to avoid the symptom of "Dutch Disease" brought about by late structural transformation from natural resource extraction to more capital-driven economic activities, such as found in Nigeria.

In summary, the high growth rate of agriculture in this period has been brought by serious efforts in focusing the policy implementation to achieve the self-sufficiency objectives – sometimes at all costs. These include significant subsidies in agriculture and infrastructures such as in the package of agricultural intensification techniques, irrigation schemes and probably in world-class research and technology in the sector. However, in the mid 1980s, when government expenditures shifted more to support industrialization, the performance of agriculture was declining significantly.

3.2.4 Phase 4: 1986-1997 Deconstruction of Agriculture

The 1986-1997 period marked a significant difference in Indonesian agriculture, particularly after the achievement of rice self-sufficiency in 1985. The agricultural GDP grew only at 3.4 percent per year, as agricultural sector seriously suffers from ignorance in the policy priorities. Consequently, the welfare effects of such growth performance were not much, as the growth of labor productivity was less than 2 percent per year. The slow rate of agricultural growth was associated with the policy shifts more on the industrial sector of labor-intensive exporting commodities, starting from the mid 1980s. Government expenditures in the form of fertilizer subsidy declined from Rp 756 billion in 1987 to only Rp 175 billion in 1991, which in real terms the effects of this decline are more severe. Fertilizer subsidy finally was removed in 1998 at the economic crisis, while food subsidy has been abolished since 1986. The promotion of industrial development in Indonesia in that period has been under heavy protection at the expense of agricultural sector growth. The government has controlled the price and trade of selected products, not to mention the political economy arguments of uneven access on resources and economic opportunities.

Deconstruction of agriculture accelerates in the early 1990s, as both scientists and policy makers have ignored the real roles of agriculture in economic development. Agriculture is only treated as "another sector" that could make contribution to economic growth and development. This ignorance was also brought about by a remarkable achievement in the sector of manufacturing and industry, which have recorded a two-digit growth level. Other sectors in the economy such as banking, trade and service sectors have also grow very rapidly, which then mislead many economists and policy makers to have a conclusion that structural transformation has completed. Government policies tend to fully adopt the presumed condition of

"take-off" (according to Rostow's term), so that the development strategy relies very much on high technology and capital-intensive industries, including aircraft, petrochemical, etc. Foreign aid neglected agriculture during this period, reinforcing the government's urban bias.

In the words of Timmer (1993), both politics and market undervalue agricultural sectors, and even ignore the major contribution of agricultural progress in the structural transformation of the Indonesian economy. No major agricultural policies has been introduced and adopted to improve efficiency level and market-oriented strategies in agriculture. If any, agricultural policies only benefit urban consumers and traders, but undermine farmers and rural people as the ultimate group of society, even contributing to the political system. The floor price policy in rice is the most well recommended public policies being biased to urban consumers and traders, although often cited as very important for poverty alleviation.

Policies on nucleus-estate smallholders (NES), comparable of dual economy strategy are often seen as a panacea to bridge between traditional and modern sectors. At some points, the model has noted some progress in generating export revenue in mostly palm oil, rubber and some coconuts. Estate sub-sector in general still enjoyed over six percent growth rate in the period because of export earnings. However, food crop sectors really suffered from the policy environment, and Indonesia has imported rice again until now. The most crucial component of structural transformation is actually to strengthen the basis of the economy, where agriculture and rural sector in general should obtain more focused attention. Improvement in the links between agricultural sector and the rests of the economy would influence the flow of labor and resources between the traditional and modern sectors

The negative effects were indicative when accumulated burden of agricultural sector increased very rapidly in the 1990s. The pace of conglomeration also stimulates intensive decision in land expansion by large-scale companies often at the expense of forestland and other unnecessary conversions of non-agricultural uses. For the shake of economic efficiency, conglomeration process continues to occur under land acquisitions previously managed by small-scale farmers or by traditional groups of society. In the absence of property rights and poorly setting of institutional arrangements, agricultural sector is really in the middle of deconstruction phase. Agricultural policies often result in accrued benefits for large-scale companies, and the economy as a whole suffers from the worst level of inequality.

In additions to such worst level of inequality, Indonesian agriculture has also suffered from resource degradation in almost every single space of the country. Severe El-Nino driven droughts in 1992/1993 and pest attacks in many rice fields in Java, and price decline in some cash crops have contributed to the flattening, if not declining, patterns of growth production and productivity. Externality impacts of resource degradation in agricultural production seem more dominant than the positive income transfer brought about by intensification decision and land investment made for conservation purposes. Food sub-sector once again has to depend very much on import, where Indonesia has imported rice, corns, soybean, etc,

either for domestic consumption or for meeting the demand from agro-based industries. Meanwhile, newly renown cash crops CPO (crude palm oil) has to fight severely at international market with other sources of edible oil such as soybean oil.

In December of 1995, the government has tried to overcome such a dilemma and launched a very controversial mega policy of one million hectare peat-land conversion into agricultural field in Kalimantan. The policy has been criticized for trying to regain self-sufficiency status in food sector at all cost. Centralized command, one-way direction, and the death of collective action in public policy of agriculture are among factors contributing to the wrong policy formulation. As expected, the mega policy fails to contribute to overcome the decline in agricultural production, particularly in food sector, because the problems were not simply at the supply side. The actual problems rooted in the weak foundation of economic development strategy and policy settings to anticipate the rapid changes in global economy. Some have argued that ersatz capitalism adopted in Indonesia significantly contributes to the poor quality of public policy in agricultural sector and in the economy.

Furthermore, the protection and intervention regime in industrial promotion have caused income disparities between regions and drawn high demand on decentralization and regional autonomy. Basically, these intervention regimes have favored Java and taxed non-Java provinces. As mentioned previously, the protection on manufacturing have accounted more than 10 times as much as protection on agricultural and forestry. A very significant different in resource endowments between rural and urban areas, between regions, particularly between Java and the other islands have caused more acute regional disparities in Indonesia. This is probably one important factor in explaining poverty performance in the country.

Overriding all the above however is the failure to grasp how important to future growth will be the high value commodity sub-sectors, particularly horticulture and livestock and fisheries. On the order of half of all incremental production will come from these two sectors. Domestic demand will grow rapidly one recovery sets in and exports or import displacement potentials are large. But, these sectors require far more infrastructure investment than for the cereal sector, much more expansionary rural finance, a vigorous development of efforts to include small farmers in the super market revolution, reorientation of research and numerous approaches to assisting the private sector I\as delineated in Chapter 6, below.

3.2.5 Phase 5: 1997-2000 Agriculture in Economic Crisis

During the economic crisis of 1997-2000, agricultural sector also suffered from the high rate of inflation. At the peak of currency devaluation in 1998, agriculture seemed to enjoy windfall profits from exporting commodities such as coffee, rubber, pepper, shrimp and other fishery products. This high economic return could not offset the burden of agricultural sectors when low-skill urban workers have flocked into rural areas because of huge number of lay-offs in urban sectors. Both formal and informal workers have to find some jobs in rural areas, as the crisis hit more

severely some sectors in urban areas. As a result, the growth rate of agricultural GDP in the period of 1997-2000 was quite small, about 1.6 percent per year, while the rests of the economy also experienced a severe contraction. Agricultural production and productivity was stagnant or even slightly negative of less than half percent. Labor productivity was declined at a rate of -1.5 percent per year, showing stagnation of the economy, in general.

From this positive growth rate, agriculture was once expected very much as a basis to restore the economy, and resource-based sectors became political jargon. This high expectation cannot meet the reality when the case of huge rice import of 5.8 million tons and 1.5 million tons in 1998 and 1999 respectively has been cited as mismanagement on food policy. In additions, El Nino driven drought in 1997/1998 has been blamed for the slow down in agricultural growth and the persistent effects of forest fires that also affects neighboring countries Malaysia and Singapore. An interim Indonesian President BJ Habibie was trying to switch the development strategy to restore the resource-based economy by allocating some efforts for cash-crop development and other policies in subsidized credits for agriculture and small-medium enterprises (SME). However, inconsistent export policies in CPO and coffee and a surge of import in raw sugar have signaled wrong incentives for farmers to increase agricultural production and productivity.

In the crisis year, there are difficulties of reconstructing agricultural policies when democracy is translated in several different meanings and where the patterns of economic policy reforms were far from clear. During a short period of the administration of President Abdurrahman Wahid (1999-2001), a model of corporate farm was tried to be introduced as a means to integrate a more modernized decision making process in agribusiness world into food production and agricultural development. However, because of the weakness in theoretical and policy foundation in such a concept, corporate farm model was rejected by the society. Many have also argued that political interests, level of confidence on Wahid administration, and quests for ideological clarity have contributed to the rejection. More importantly, such inconsistencies in economic policies and heavy political maneuvers and frequent cabinet reshuffling during President Wahid administration have contributed to the fall of President Wahid in July of 2001. The prominent consequence of this political turmoil is that the reconstruction of agricultural policies since the administration President Megawati Soekarnoputri seems to restart over from zero.

The same high expectation to reconstruct agricultural policy and to promote small and medium-scale enterprise (SME) development is also put on the shoulder of President Megawati (2001- present) – then vice president of Wahid – as the major supporters of Megawati's party (PDIP) are also farmers and rural villagers. During the first months in power, economic team of Megawati administration has received a warm welcome from the public. High qualification and credibility of cabinet members -- sometimes labeled as market-friendly -- seem to meet the expectation. At least, the public policy was not formulated in the middle of controversy and President Megawati is able to maintain "political calamity", although triggering

criticism for not having a sufficient response of statement to important public issues. However, this calamity is not adequate to stimulate and maintain a momentum for economic recovery, where economic growth has decline from 4.8 percent in 2000 to 3.3 percent in 2001. Agricultural sector equally could not achieve a minimum level of 2 percent required to maintain subsistence level of the society, primarily because of low performance in food crops and cash crops.

3.2.6 Phase 6: 2001 – Present: Political Transition and Decentralization

In the present political transition and decentralization of economic policies up to district level, agricultural sector does not perform very well to provide basis for future strategy and development. The paths of reconstructing agriculture in political transition of democracy and decentralization require logical translation from ideological and strategic level of policy into a more operational policy formulation. Otherwise, the path for agricultural development in Indonesian is constantly facing difficult problems of low level of growth, flattening, if not declining yield, low labor productivity and inefficiency in resource uses, and threatening resource degradation

In 2001, Indonesia has entered into a decentralized era, after decentralization policies of Law 22/1999 on Regional Government and Law 25/1999 on Fiscal Decentralization has become effective. Law 22/1999 is an attempt to democratize local government and to develop certain powers without or with minimum intervention from the central government. Law 25/1999 is designed to support that shift of power to the local government by providing more fiscal resources, or what is known as balancing financial power between central and local government. These two laws were the results of the heavy crisis of center-regions relations occurred during Soeharto administration.

Even though no clear direction, recent literature and some empirical evidence on decentralization policies generally does not show promising outcome for agricultural development. As local government has more privilege and authority to formulate local level policy for sectoral and regional development, nearly a thousand new rules and regulations were passed at local level, primarily local taxes and retributions on various activities of agricultural-related regional development. Some argues that the level of business confidence has dropped significantly in association with increased unpredictability, weak institutional settings of the current decentralization era. A primary reasons supporting the pessimistic view about decentralization and the regional autonomy is that greater authority to formulate local-level budget does not always translate into a better perspective of social justice. Fiscal decentralization is often interpreted as more revenue (from natural resources and local taxes), instead of more responsibilities in formulating local-level policies that can compatible for agricultural development.

Within the context of agricultural development, a positive atmosphere about decentralization is that almost all districts and/or city and provincial government have put high priority on agribusiness and agricultural development as one of the main priorities for regional development. However, policies for agricultural

development should not stop only at the rhetoric level only, but rather go deep down into actual implementation level involving several interested parties concerned with regional development and the national development as a whole. The challenging issues then are how to capture such local interests into a more orchestrated agricultural development at national level to meet overall national objectives and policy reforms on reconstructing agriculture.

By the time of this writing, it is too premature to offer an empirical statement on how the new decentralization policies in Indonesia have contributed to good governance and better public services in Indonesia. In fact, some have argued that increased power among the elites in the regions has complicated the well-known corruption problems due to weak rules of law in the country. Business entities and other economic actors have complained about increased country risks in the regions due to economic uncertainty and business unpredictability of future benefit streams. Policies of regional autonomy do not increase the amount of investment in the regions, but could contribute to inflationary effects of new local taxes and retributions, and increase unpredictable costs of doing business in Indonesia (Arifin, 2002).

Studies by LPEM-UI (2001) also indicate an increase in additional costs of 10 percent in Java and 11 percent outside Java to deal with bureaucracy in the regions. Small and medium-scale enterprises (SME) have to pay 11 percent additional production costs, while large-scale enterprises have to burden only 8 percent additional costs in doing business in the regions after the policies of regional autonomy. However, how deep the magnitude of these problems remains important questions in the future because the public debates and opinion exchanges around the issues mostly stem on the surface, rather than crawling down into the roots of the problems.

More and more political elites at central level, including top senior government officials such as the Minister of Home Affairs have accused that regional autonomy has implied an absolute power among the executive and legislative members, which then contribute to the new strains of corruption at local levels. When the civil society is not yet develop in improving the control mechanism on the use of public finance at local level, when the central government has a very limited ability to perform an administrative and financial audits, the probability on misuse of public funds would increase. However, those in favor of the current set-up of decentralization and regional autonomy such as outlined in Law 22/1999 and Law 25/1999 have argued that the persistent problems of weak institutions, inefficient bureaucratic systems and poor control mechanisms in the government administration at central level have contributed to the current pace of regional autonomy.

To some extends, both arguments seem warranted, especially in the absent of more comprehensive policy evaluation. Both arguments seem to be supported by reasonable explanations in relations to the ultimate agenda of each party to gain public sympathy on the performance of decentralization and regional autonomy. On one side, decentralization is argued as the most prominent way to improve the

efficiency of resource allocation, promote accountability and reduce corruption within government, and improve cost recovery, such as in the standard neoclassical economic arguments. The accusation of new strain of corruption at local level or any other discouragements about the future outcome of decentralization is simply thought as a form of resistance posed by central-government authority or those in favor of centralized system.

The latter term certainly has negative connotation, often associated with well-enforced linear system during Soeharto administration, so that decentralization generally obtain more sympathy. On the other side, decentralization is misinterpreted as simply more power and privilege with minimal control mechanism to formulate new policies at local level so that the whole issues of efficiency in resource allocation and governance are still very dependent on the quality of policy-making process at local level, democracy performance, and the rules and norms of public participation. The arguments generally are very skeptical about the diversity of resources endowments, particularly education level and human resource quality among regions in Indonesia. Unfortunately, these public debates do not move forwards on how to formulate policy agenda in meeting the ultimate objectives of decentralization and regional autonomy to improve the welfare of people in the whole country. Open dialogues between local and central government are very minimal, if any, these policy steps are very ad-hoc in fashions and aimed at solving the problems on the surface only, rather than establishing more concrete policy strategies to implement the decentralization policies.

Agricultural policies in the era of decentralization would face serious challenges -- the heaviest ever since the New Order -- when local level policies are badly fragmented into pieces and serve the short-term interests of parties involved. Some empirical stories and anecdotal experiences presented in this section should provide a first sight of the tendency commonly found during the decentralization era. Some facts might need careful field verifications and rigorous academic examinations, but general scene should remain similar given that the norms and customs being adopted in the policy making and implementation process cannot change overnight only by new formal laws and policies.

Chapter

4

POLICIES FOR RAPID AGRICULTURAL AND EMPLOYMENT GROWTH

Shift to a new strategy of agricultural productivity and income growth requires increased support to agricultural policy analysis and implementation. The analytical needs and criteria will be greater, and will possibly change, as compared to the past. Given a new thrust, a substantial input of knowledge of transnational experience is particularly important.

The first requirement is a priority setting exercise, built on the new thrust and strategy for agricultural development. Within that priority setting exercise, the other analytical needs can be pursued, and then carried out with additional intensity as the initial work suggests is appropriate.

A conducive policy environment is particularly important to rapid agricultural growth based substantially on the high value agricultural commodities. These are commercial commodities that are mostly perishable and in many cases dependent on export markets. They require low transactions costs, competitive exchange rates, substantial users of borrowed capital, and use a wide range of public goods from research to information systems. These interests require representation in policy councils throughout the government, and capacity for policy analysis in a context of understanding the needs of the rapid growth agricultural sub-sectors.

The private sector of small farmers and entrepreneurs will decide the orientation for growth. However, this cannot be done if there is not a favorable policy environment. A favorable policy environment involves making decisions that will increase profitability of favorable investments. Informed decisions require intelligent analysis and application.

From previous investments in policy analysis capacities, Indonesia now benefits and has a rich supply of analysts working in a wide range of institutions around the country. As more demanding sub-sectors of agriculture expand in size and complexity of their problems, the requirement for these human and institutional capacities will be more rigorous than in the past.

Economic and political analysis skills are needed to assist farmers' associations and trade associations in diagnosing the policy issues, developing positions, and presenting logical action. Similarly, government agencies should be equally sophisticated in weighing economic costs and benefits. Universities are not only training centers for policy analysis, but they conduct critical research to aid the private and public sectors in their decision-making.

Foreign assistance plays an important role in these processes. Knowledge sharing and dissemination provide expertise in the latest analytical techniques, and experience with new hypothesis and conceptual frameworks. National comparative experience holds great value in the dynamic world of policy problems and analysis, especially as best practices and lessons learned. Foreign assistance can offer global education and training to local experts, essential when building institutions and upgrading national capacities are in greater demand.

Many of the policy issues vital to rapid agricultural growth are strongly influenced by international organizations and bilateral foreign assistance programs. Indonesian officials and analysts should be well-informed to communicate and negotiate their needs from international and bilateral institutions, as well as understand the political and economic contexts and arguments.

Policy favorable for agricultural production and income growth requires dynamic analysis. Agricultural policy problems have some constants, but they are more characterized by trends and "hot" issues that constantly change. To deal with the dynamics of policy, institutional capacity needs to stay abreast of the issues relating to universities, farmers and trade associations, and the government itself.

Implementation of policies conducive to agricultural production and income growth also depends on policy advocacy by farmers and entrepreneurs. The impetus for agriculture-driven growth, small farmers and small entrepreneurs need organizational support to make their voices heard, and analytical capacity to help them define their interests. Their organizations need to be experienced in providing accurate analysis, giving strong presentations, and handling political maneuverings in order to effectively influence the decision-making process.

4.1 Policy Analysis Priorities

The priorities for policy analysis and action are dynamic, changing with the international environment, and the pace and pattern of domestic development. Following are the most pressing challenges, but by no means an exhaustive list. They are all of increasing importance as the growth composition shifts towards the high value commodities. The last category is specific to the agribusiness sector that is vital to the growth of the high value commodity sub-sectors. Each topic is briefly treated to indicate the current policy constraints with respect to rapid agricultural growth, and to indicate priorities for analytical effort.

4.1.1 Strategic Priority Setting

The basis for a high agricultural growth rate now is very different to that of the 1980s, which was carried largely by the extraordinary success of rice and maize. Presently, rice

is much less important as a share of agricultural GDP, and has less potential for further growth. There is insufficient understanding by Indonesia and the donor community that the bulk of future growth will come from high value commodities.

Careful analysis, with full stakeholder participation, of the new sources of growth, and of the required public goods support will be essential for realizing the untapped opportunities.

High value perishable commodity sub sectors and estate crops will account on the order of 80 percent of incremental growth. The policy, institutional and investment needs differ among these sectors. Most importantly, public expenditures have long lead times, thus requiring advance projections of the needs, priorities, and sequences critical to accelerated agricultural growth

Thus, a strategic plan is essential. Requiring policy analysis at every stage, it needs to be dynamic and capable of being adjusted as new knowledge and development occur. Additionally, it requires full participation of a wide variety of stakeholders, and formulated in guidance by best practices and lessons learned in other countries. An effective strategic plan requires considerable time and substantial resources. At this turning point in agricultural growth structure, such a plan should be a high priority for Indonesia.

Some task order to create an effective national strategy should include a broadly representative steering committee, consultative workshops at several stages of strategy development, a highly experienced secretariat, a wide range of analytical documents and tools, and a panel of experts who possess in-depth knowledge, not only of Indonesia but of efforts in other countries.

4.1.2 Priorities for Physical Infrastructure Investment

In a world of increasing globalization, ability to compete requires low transaction costs, as reflected in infrastructure investments of roads, railroads, electricity, and irrigation. In the last period of rapid agricultural growth, rural investment in transportation and public facilities were immense. Investment in infrastructure is a boundless task of construction and maintenance. Competitors are constantly upgrading their systems to reduce their transaction costs, and becoming more competitive. Not keeping up means less growth, lower incomes and eventually retrogression to low-income subsistence agriculture with a contracting rural non-farm sector and rapidly increasing poverty.

The single most important factor holding back agricultural growth at present is the poor state of physical infrastructure. It is generally stated in Indonesia that not only is the physical infrastructure not being steadily improved, but it is deteriorating. For example 70 percent of the national mileage of roads is at the village level and 70 percent of those roads are reported to be in poor condition (World Bank 1992). As stated in Chapter 2 of

this report, 75 percent of incremental growth in agriculture is expected to be in the sectors that produce high value, which are generally perishable commodities. They require constantly improving infrastructure.

The infrastructure issues are complex, and require analysis if good policy is to be made. This is an issue that involves Ministries other than agriculture, and other non-agricultural considerations. It is essential that some analysis take the approach from an agricultural growth perspective.

One of the major complexities to infrastructure investment is decentralization. Decentralization cuts far beyond the Ministry of Agriculture, but agriculture is the most important beneficiary, and requires analysis and advocacy. Decentralization should assist in providing greater efficiency, based on local knowledge, in implementing infrastructure schemes. In the longer run, raising additional resources from local beneficiaries to finance expanded investment needs to occur. Helping local governments to rapidly expand investment in rural infrastructure should be a priority of the decentralization process.

There is, however, a complex issue about reconciling local control of infrastructure investment resources with national priorities and coordination. Analysis is needed of the national needs, and of the relation to local capabilities and priorities. A national plan for infrastructure development should reflect the rapidly increasing needs of the high value agricultural sector, and carried down to the local level.

How do national needs get met in the context of decentralization? High agricultural growth rates will, at any point in time, be concentrated in a few geographic areas. These areas' infrastructure needs to be diagnosed and given priority. The links between various forms of physical infrastructure need to be understood, and appropriate policies made. These are examples of the pressing problems that require analysis, if the infrastructure investment is to be at the level and with the allocations required for rapid growth

4.1.3 The Interaction of Education, Employment, and Agricultural Growth

As rapid agricultural growth stimulates rural employment growth, the demand for educated people accelerates faster than overall employment – and conversely when agriculture grows little or not at all – as at present in Indonesia. Slow growth raises school drop out rates, particularly in low-income families for whom income foregone by school attendees is important. However, rapid growth in high value agricultural commodities itself requires large numbers of educated people. Thus, there is push and pull demand for education related to agricultural growth. Where that agricultural growth occurs, at what rate, and with what composition interacts profoundly with educational investment. Analysis is needed to improve the coordination among these complementary functions. Until such analysis is available, there is bound to be substantial inefficiency in educational and in agricultural growth investments.

4.1.4 Research

More than other sectors, rapid agricultural growth is dependent on research based technological advance, since land is quite limited and is a major input into agricultural production. In the long run, increase in production depends on raising yields per unit area of land. In practice, that raises labor productivity as well. The net income of farmers increases, and provides the basis for stimulating the employment-intensive rural non-farm sector.

Farmers do research themselves. They carefully select for more productive seeds and improve their cultivation practices. But, without the base of pure science, their results come slowly – perhaps at no more than half a percent a year, which does not even keep up with population growth.

It is institutionalized, specialized science-based research that brings rapid increase in farm productivity. Indonesia experienced a period of extraordinary growth in rice yields in the 1980s that drove poverty reduction. The research came in part from the international system of rice research and partly from the national systems adaptation. But, for continued rapid growth those dynamic processes of yield increase need to be maintained by continued research in rice and expansion into a few carefully selected components of the high growth high value sub-sectors that are the key to future dynamic growth.

Unfortunately, while research expenditure should have continued to increase beyond the level of the 1980s it has declined. Indonesia spends a smaller proportion of its agricultural GDP on research than other countries in the region. That small allocation to research is misallocated as well. Not a high enough proportion is spent on the operating budget for research so that well trained people have inadequate supporting resources to do good research. Further, the limited budget is spread over too wide a set of activities so that a world-class level is unlikely to be achieved in any area. Indonesia is also giving inadequate support to incorporating biotechnology into its research system and to the accompanying regulatory systems.

In this age of globalization, advantage will increasingly shift to producing products for which science has most increased productivity. Competing requires world-class science systems. Seeing that Indonesia has that world-class system in key areas in which it is to compete is a critical policy issue. An integral part of that policy issue is the level and allocation among regions and commodities of biotech research.

A further policy issue is the interaction of the public sector with the private sector, including both national and international private sector research. In the current global context that relation has to be seen as a supporting partnership.

Careful analysis and implementation of research priorities would provide the basis for large increases in research budgets. Such analysis is particularly important and difficult in the context for decentralization. On the one hand decentralization will help set priorities according to local needs. However, it may lead to fractionization of research and failure to achieve critical levels of efforts How decentralized research can be managed to provide essential interactions with components that have major scale economies would be an integral part of such analysis.

4.1.5 Biotech Policy

The world is at a critical turning point on biotechnology. Indonesia is an important player in that process and will influence significantly which way matters turn. It needs collaborative efforts to analyze the issues and to develop appropriate policy. Biotech policy needs to be analyzed in the context of the larger agricultural growth strategy and the larger research allocation issues.

4.1.6 Agricultural Price Policy and its Interactions with Poverty

Not just rice price policy, but also a whole range of pricing issues will be important determinants of progress in agricultural growth and in poverty reduction. There is scope for error with massive costs. It is critical that intensive policy analysis of these critical issues continue, drawing upon major experiences in other countries.

Reduction of poverty and the added benefits accompanying such reduction, increased employment and reduced rural urban income disparities, is an important objective. Policies supporting this objective interact with agricultural growth. Rapid growth in farm incomes is the most important single factor in poverty reduction, working through stimulus to the large, employment intensive rural non-farm sector.

Agricultural prices have opposing effects on key components of poverty reduction. Higher agricultural prices do encourage increased agricultural production, which in turn expands the demand for employment in the rural non-farm sector. However, they have a large effect in directly reducing real incomes of the poor. The latter is because on the order of 70 percent of the income of those in poverty is spent on food. Higher prices of food directly reduce real income.

Recent experience suggests that in Indonesia the direct poverty-reducing effect of lower agricultural prices is greater than the indirect effect working through employment (Assa 2000). In the crisis period, agricultural prices, and particularly the price of rice, increased greatly in real terms. However, the growth rate in rice production did not increase over earlier periods. The lower price did increase farmers' incomes and increased the employment of labor both on farms and in the rural non-farm sector. The production relationships are complex and other factors such as reduced success in rice research were also operating. At the very least it can be said that emphasis should be

placed on non-price forces to increase agricultural incomes – such as research, infrastructure investment, and development of agribusiness systems for high value agricultural commodities.

Social expenditure, particularly on education and health measures, can directly decrease poverty. Again there is a conflict between increased social expenditures to directly reduce poverty and expenditures to increase agricultural incomes and hence employment of the poor. Education expenditure without growth in farm incomes has reduced impact on poverty because of lack of jobs and consequent reduced motivation for parents to keep their children in school. Conversely, as agricultural incomes grow the need for and rate of return to education increases. The policy issue is what is the optimal balance of public expenditure for agricultural growth and public expenditure for social categories to achieve the objective of reduced poverty.

The relationships are more complex because without continuous improvement in rural infrastructure expenditure on social items is inefficient. Educated people so essential to the institutions of agricultural growth and education do not want to live in areas with poor physical infrastructure. Not only is agricultural growth slowed for lack of educated people for productive institutions, but the social institutions are poorly staffed as well.

Finally, there is the issue of economic and social safety nets for the poor – expenditure on subsidies and other means of maintaining the incomes of the poor in the face of stressful conditions. Again, choosing the right policy requires analysis of the tradeoffs between expenditure on social safety nets – most frequently subsidies of rice prices – and investment in agricultural growth and the concomitant employment growth.

4.1.7 Exchange Rate

The new sources of growth in Indonesian agriculture are far more dependent on well working foreign exchange and financial markets than the rice dominated growth of a few decades ago. These are issues in which agriculture is only one of several important interest groups. In that complex context the implications to agriculture need to be carefully analyzed and put on the table.

The bulk of agriculture produces tradable goods the price of which is determined by international supply and demand relationships, rather than domestic relationships, with those international relationships filtered through the exchange rate.

Agriculture benefits from a low price of foreign exchange. Thus, the radical depreciation in the recent crisis period was generally beneficial to agriculture. Similarly any overvaluation of the exchange rate due to the management of oil and gas exports is detrimental to agriculture. The large size of natural resource exports makes an overvaluation of the exchange particularly likely and therefore requires constant oversight from the point of view of major export interests such as those of agriculture.

Agriculture has been a principal beneficiary of Indonesia's generally successful effort to ensure that major oil and gas exports do not appreciate the currency to the point of prejudicing exports of other goods and services. It is essential to agricultures growth and to poverty reduction that those policies continue. Therefore, there needs to be continuous monitoring of the impact of exchange rate policies on agricultural prices and trade.

4.1.8 Interest Rate and Financial Flows

Farmers the world over agitate for expansion of the money supply and low cost credit. That is because farmers tend to be relatively low-income people with substantial requirements to finance purchase of operating goods and intermediate term investment. Farmers are also dependent for income growth on the agribusinesses oriented towards high value, perishable commodities that are also dependent on borrowed funds for expansion needed for rapid agricultural growth and poverty reduction. In Indonesia high interest rate policies fall heavily on agriculture, which generally lacks the coping mechanisms, open to large urban industry that can borrow abroad and may receive direct and indirect government subsidies, and may have privileged access to the banking system.

Currently efforts to control inflation and to restore the balance sheets of banks have resulted in interest rates that are very high by regional and world standards. Business people consistently relate that interest payments take a major share of operating profits thereby discouraging borrowing and growth. That is clearly falling heavily on the expansion of the horticulture sector both for the domestic market and for exports.

Agricultural processors in high growth sub-sector consistently report gross profit margins of around 30 percent and interest rates of around 20 percent. Thus, the banks are taking two-thirds of the gross profit. As banks become recapitalized, competition should cut those interest rates in half. It should be noted in this context that recently agricultural prices do not seem to be increasing as rapidly as the overall inflation rate, meaning that the real interest rate in the agricultural sector is lower than the nominal rate minus the average inflation rate.

Lower inflation rates should reduce the variance in interest rates among commodities. Hence agricultural growth is helped by low inflation rates. However, constraining public expenditure to control inflation falls particularly harshly on agriculture with its major dependence on public goods such as rural infrastructure, research, and information systems. When budgets are cut analysis is needed of the appropriate balance in cuts among the various sectors. Continuous analysis and advocacy on this important issue must be planned.

Closely related to interest rates is the availability of credit, credit institutions and rural financial institutions more generally. Certainly convenience of access to credit interacts

with the interest rate in affecting investment decisions. In this context policy on land tenure and titling bulks large because of its relation to credit availability, collateral for credit and related aspects of interest rates. Analysis is needed in this area.

4.2 Agribusiness Analytic and Policy Needs

As set forth in other chapters of this report, agribusiness development is critical to the high value commodities that will drive accelerated agricultural growth. That sector requires analytical support in a wide range of issues, including the rapidly evolving impact of supermarkets on the potential for small farmers in high value commodities, helping local governments prioritize infrastructure investment to facilitate agribusiness growth, analysis of the regulatory systems and their ability to evolve with rapidly changing requirements of overseas and domestic supermarkets, the role of public goods in the cold chain, airport development, improvement of customs operation and so on.

- **Provide Assistance to Local Governments in Prioritizing and Coordinating their Transport Infrastructure Planning**

The poor state of most rural transport infrastructure is a major constraint to agribusiness development. This has a particularly adverse effect on perishable high value commodities. Decentralization has devolved responsibility for infrastructure planning and development to local governments. These governments require assistance in planning and developing transport infrastructure as well as in coordinating that development with neighboring and nearby local government units.

One approach by USAID to providing this assistance would be to conduct a series of studies aimed at mapping the roads linking important production centers to their markets and then documenting needed repairs and rehabilitation (or in some cases, new construction) to improve these links.

- **Analyze and Document the Procurement Policies, Procedures and Practices of the Local Supermarket Sector**

This analysis would include anticipating future trends and determine how best to increase the profitable participation of local farmers and traders in the supermarket supply chain.

Growth in agribusiness systems depends on increases in market demand. The proliferation of supermarkets throughout Indonesia is increasing marketing opportunities for high value food products, particularly for horticultural commodities. Since supermarkets are responsible for most of the growth in market demand for high value agricultural products, it is imperative that small and medium scale farmers and traders gain a better understanding of supermarket procurement operations including

specifications and buying procedures, as well as a sense of the changes that may occur in these operations in the future, in order to gain maximum benefit from supermarket growth. This will require an in-depth assessment of the supermarket sector.

- **Conduct a Study to Analyze the Strengths and Weaknesses of the Current Regulations and Procedures Governing the Establishment and Operation of Nucleus Enterprise (partnership) Models in Agriculture and Recommend Measures to Improve their Operations and to Expand their Scope and Coverage**

The nucleus enterprise model (NEM), or the partnership system, as it is known in Indonesia, can serve as a very important tool for integrating small scale and medium scale farmers into commercial agribusiness systems. The Indonesian government formalized the model in a regulation promulgated in 1997. While a number of large agribusiness firms have been able to effectively apply the model in their relationships with producer-suppliers, the regulations and their implementation need to be reviewed and improved in order for the model to have a greater impact on the integration of small farmers into agribusiness systems.

4.3 Institutions for Policy Analysis

Policy analysis must now be carried out in a wide range of institutional structures. It is important that trade associations build capacity for analysis as well as for advocacy. A USAID policy project could contribute greatly to buildings those private sector capacities. Decentralization is increasing the importance of regional institutions. A policy project needs to build on past highly effective USAID interactions in building regional capacities and integrating them into national centers of excellence. A policy project must have a clear set of objectives with respect to national centers of excellence, regional centers and the private sector capacities and build effectively to develop and integrate these institutions with a constant eye on policy advocacy functions.

Indonesia has a solid core of public institutions with excellent staff at both the national and regional levels. That is a solid base on which to build. There is little capacity in the private sector trade associations. Building that will be a slow but important process.

In Indonesia, the large geographic spread of the country across many ecological regions and cultures and its large size in terms of geographic area and population require a large number of policy analysis institutions widely spread geographically. There are now a sufficient number of well-trained analysts to allow working with a large number of institutions. Those institutions include universities, government institutions, trade associations, and farmer's organizations. There is a need to work at upgrading analytical capacity and linking these diverse efforts so that they can be mutually reinforcing.

4.4 Institutions for Policy Advocacy

Policy analysis is effective when it enters policy processes with analytically sound advocacy. Again, Indonesia requires a wide diversity of advocacy institutions spreading across the University, government and private sector communities. In some of these institutions advocacy may be more ahead of analytical capacity. For example, the private sector may draw upon analytical work from universities, but there is need for building links among these institutions so that effective advocacy may occur.

4.5 What Does Foreign Assistance Have to Contribute to Policy Analysis?

Agricultural policy is a highly political process that has profound implications for distribution of income across regions, interest groups and income classes. Thus, it is a particularly delicate area for foreign input. However, there are strong reasons for foreign input.

Perhaps most important in this dynamic and globalizing world, maintaining position and catching up with growth elsewhere is a critical source of domestic growth. Foreign input into policy analysis can assist in benefiting from what can be learned from experience in similar situations elsewhere including the historical experience of high-income countries and the contemporary experience of middle and low-income countries. Interaction of those highly knowledgeable on those processes can leaven and enrich the national experience.

Foreign countries and international organizations have an important impact on the environment within which Indonesian policy is generated. The flow of foreign private investment, of foreign aid, and of international rules and policies all impinge on Indonesian development. It is desirable that the policy makers in those environments have analysts who participate in interactions in the Indonesian policy process. Improved knowledge should lead to improved policy at the international as well as at the national level.

Domestic analysts have great difficulty in setting a short list of priorities and optimal sequences of actions. Foreign analysts are tuned to a different set of pressures to broaden priorities. But at the least, the interaction of national and foreign can work to reduce the priorities and sharpen the sequences. Hopefully each will cut the other's excessively broad list.

Finally, high-income countries have a great wealth of input into development of sophisticated analytical tools. Bringing quick access to those is another advantage of foreign assistance in the policy process.

All those advantages of foreign assistance can be substituted for and enhanced by participation of Indonesians in overseas interactions and training. That would be an efficient component of foreign technical assistance to the policy process.

To be effective, foreign assistance to the policy process would emphasize building national capacity through training and institution building, facilitate interactions within and across constituencies, and demonstrate sound analysis, carrying through to policy advocacy and impact.

Chapter

5

SUSTAINING TECHNOLOGICAL PROGRESS TO SUPPORT RAPID AGRICULTURAL GROWTH

Technological change in agriculture is central to rapid growth in agricultural production, productivity, and farm incomes. The period of very rapid growth in Indonesia's agriculture was a period of very rapid technological advance based in radical improvements in rice and maize varieties. In that period, support for agricultural research also grew rapidly. Following the period of rapid agricultural growth support for the research system declined relatively and then took a precipitous drop in the context of the economic crisis. Most striking the support per senior research declined precipitously greatly reducing the capacity for researchers to do research.

In earlier periods of decreased government support, foreign donors filled the gap. That did not happen in the recent decline. Concurrently with the decline in support for research, the complexity and magnitude of the needs has been greatly increased by a shift in growth from cereals to high value commodities and by decentralization.

Now, it is urgent that financial support increase by a massive amount, that recent advances in biotechnology be mobilized to increase the efficiency in the use of research resources, and priorities be concurrently narrowed and shifted to emphasize new sources of growth, even while progress in rice and wheat is accelerated.

Globally the private sector is playing a larger and larger role in agricultural research. The private sector will gradually increase in importance in Indonesia. Thus, research planning must take an overall view, respond to the differential comparative advantage in the private and public sectors in different commodities, and emphasize cooperation and meshing of resources in the two sectors.

5.1 Critical Role Of Technology

If Indonesia is to pursue rapid growth in the agricultural sector, agricultural technology must play a critical role. Competitive advantage of agricultural products depends upon the continual stream of innovations in the production and service process. Innovations management has become especially important as Indonesian agricultural products face greater competitive challenges on a global scale.

In the context of economic crisis recovery, agricultural sector growth has a formidable role in reducing poverty in the rural areas. Strong agricultural growth will raise the

income of farmers and some of the poorest rural populations, as well as stem urban migration from rural areas.

With the changing trends and policies in international development, an agricultural research system should be sensitive, responsive and proactive to frequent adjustments. Capacity strengthening of agricultural research systems in Indonesia is needed to create innovation in technologies, services and work practices, in order to enhance productivity. Particularly, it is important as the agricultural sector will fuel the engine of development towards economic growth revitalization. Therefore, priority should be given to research reforms in order to maintain the "engine of innovation".

Agricultural productivity improvements and technology have originated and were contributed by the National Agricultural Research System, International Agricultural Research Centers, international technology transfer, and private research investment. By maintaining communication channels with these institutions and the global community, Indonesian researchers can stay current on new research topics, resources and incentives. Thus, continuous collaboration with these stakeholders is essential to support robust growth in the agricultural sector.

5.2 Investment on Research and Technology Generation

Led by priorities for food self sufficiency and food security, past agricultural policies biased the policy regime toward increasing food availability, and concentrated public investment mainly in the well-endowed rice growing areas. Few agricultural technologies were developed to solve production problems of other agricultural commodities or of poor farmers in marginal areas, and few investments were undertaken to promote technology adoption by poor farmers.

The government of Indonesia is taking important steps to correct agricultural policies. Decentralization and greater autonomy of district governments; deregulation of domestic agricultural trade; and removal of monopolies, monopsonies, and input subsidies will create the appropriate environment for increasing poor farmer incomes, but these steps alone are not sufficient. Additional policy reforms related to research and development for technological progress are required.

In a developing country such as Indonesia, agricultural research institutions typically produce public goods and are highly dependent on public financial support. These research systems are capital-intensive operations, with their most important assets being scientific information, land, building, equipment, and human capital. Investment required to reach international standards is quite high. Over the last three decades, more that US$ 500 million, from foreign loans and grant funds, were used to support research infrastructures, human resources development, imported equipment, research materials, international travel and overseas education.

USAID supported at least four agricultural research projects between the 1980s and early 1990s, namely Sumatra Agricultural Research Project (SARP), Applied Agricultural Research Project (AARP), Upland Agriculture Conservation Project (UACP), and Agriculture and Rural Support and Service Project (ARSSP). SARP and AARP focused on development of research infrastructures and human resource development. UACP developed capacity on farming system research, particularly through collaborative and adaptive farm research. As a follow-on, the Agency for Agricultural Research and Development (AARD) broadened its mission to include on-site farm research activities in addition to laboratory and experimental farm research. The fourth project, ARSSP, assisted policy analysis in agriculture research systems, linking agriculture and rural development.

The agricultural research projects were launched in the mid-1980s as a response to government budget reduction due to the decline of world oil price. Prior to the oil price decline, AARD received US$20 million from the government for its annual operational budget. In 1986, the budget allocated was about US$ 2 million or a decline of about 90 %. The other operational sub-sectors were only reduced to about a half of their operational budget in the same year. Table 5.3 shows the relative importance of foreign assistance both in terms of loan and grant to support AARD research program. The budget from USAID's research projects, therefore, was very effective to bolster continuity of research activities.

Table 5.3 The Relative Contribution of Multilateral and Bilateral Agencies in AARD System.

Investment	World Bank	ADB	USAID	Bilateral	
	1978-2003	1997-2005	1980's-1990's	Nederland	Japan
Infra structure	+++	+++	+++		+
Human Resources Development	+++	+++			+
Up stream/strategic Research	+++	++		+++	++
Adaptive Research	++	+++	+++		
Policies and rural development			+++		

+ Less significant
++ Significant
+++ Very significant

In the 1990s, the annual budget of AARD from domestic and foreign sources to cover both routine expenditures (salaries, and operation and maintenance of the infrastructures) and development expenditures (investment on infrastructures, human resource development, and research operation) steadily increased with the peak in 1996. The total expenditure of this year was 146 billion rupiah or equivalent to about US$70 million. (see Table 5.4).

Table 5.4 Development Expenditures of AARD (million US $)

No.	*Year*	*Average exchange Rate*	*Routine*	*Development*		*Total*
				domestic	*foreign*	
1	1993/94	1600	17.35	23.99	16.94	58.27
2	1994/95	1800	22.41	27.76	8.11	58.28
3	1995/96	2000	25.21	27.10	6.31	58.61
4	1996/97	2300	24.90	27.43	11.38	63.71
5	1997/98	10000	6.71	8.56	3.44	18.71
6	1998/99	12000	5.68	6.77	9.98	22.44
7	1999/00	10000	8.07	7.90	13.12	29.08
8	2000	10000	8.52	4.91	10.83	24.26
9	2001	9000	12.62	9.14	15.05	36.81
10	2002	9000	14.17	13.07	14.31	41.55
11	2003	8500	17.41	19.54	14.59	51.53

During the first two years of the financial crisis, expenditures appeared to have continually increased. However, expenditures were less than US $ 20 million, the level of expenditure before the oil crisis in the mid-1980s. In 2003, the total expenditure soared to US $ 51.53 million, which is still considerably below the 1996 level.

AARD personnel have increased significantly since the last two decades. In 1985, there were only 82 PhD researchers among a staff of 5000 people. Presently, AARD operates with more than 300 PhD researchers, and 8000 employees (see Table 5.5).

Table 5.5 Employee By Level of Education of AARD (person)

NO	Year	Educational Level							Total
		S3	S2	S1	SM	SLTA	SLTP	SD	
1	1975	7	26	243	170	459	215	2480	**3600**
2	1976	19	27	321	202	683	185	2327	**3764**
3	1977	22	30	436	221	902	192	2107	**3910**
4	1978	23	31	437	226	924	224	2260	**4125**
5	1979	24	41	556	273	1079	239	2248	**4460**
6	1980	34	133	624	289	1343	210	1914	**4547**
7	1981	23	82	474	182	997	244	1256	**3258**
8	1982	31	118	616	235	1347	277	1436	**4060**
9	1983	50	188	748	272	1643	205	1628	**4734**
10	1984	71	255	822	296	1903	251	1500	**5098**
11	1985	82	282	912	333	2074	282	1485	**5450**
12	1986	95	313	947	342	2201	211	1356	**5465**
13	1987	122	380	1027	403	2257	250	1314	**5753**
14	1988	140	417	1078	394	2360	216	1296	**5901**
15	1989	185	497	1180	381	2402	229	1222	**6096**
16	1990	193	546	1240	391	2360	226	1205	**6161**
17	1991	193	547	1254	393	2282	321	1163	**6153**
18	1992	207	580	1456	417	2749	284	1068	**6761**
19	1993	227	627	1526	448	2839	284	1043	**6994**
20	1994	241	672	1565	453	2910	283	1019	**7143**
21	1995	262	739	2012	508	3422	310	992	**8245**
22	1996	276	738	1994	485	3374	302	941	**8110**
23	1997	292	748	2042	486	3375	306	909	**8158**
24	1998	264	645	1935	480	3073	281	752	**7430**
25	1999	265	663	2078	510	3175	313	778	**7782**
26	2000 *)	265	667	2131	514	3287	347	817	**8028**

*) Data per April 2000
S3 = PhD S2=MSc S1=BSc
SM and SLTA = Height school SLTP = School SD= Elementary school

Table 5.6 Research Expenditure per PhD in AARD (Thousand US $)

Year	Number of PhD	Total Expenditure	Expenditure per PhD
1993	227	58,270.63	256.70
1994	241	58,278.33	241.82
1995	262	58,614.50	223.72
1996	276	63,714.78	230.85
1997	292	18,706.70	64.06
1998	264	22,435.50	84.98
1999	265	29,082.40	109.74
2000	265	24,258.60	91.54

Data in Table 5.6 shows the relationship between research expenditure and number of PhD researchers. The expenditure per PhD researcher between 1993 and 2000 declined drastically-- from US$256 thousand per PhD in 1993 down to US$91 thousand per PhD in 2000. The result was incapacity of many researchers, if not most, to do research. Thus, research productivity must have declined greatly.

In 1985, the AARD system had seven research centers and 16 research institutes. Now, its operation includes 27 Assessment Institute of Agricultural Technology (AIAT) in all provinces of Indonesia. Since the mid-1990s, 43 working units, excluding 9 research centers and the Secretariat of AARD, share AARD expenditures.

5.3 Community Driven Technology Generation and Dissemination

Despite the capital-intensive investment policy and centralized nature of technology generation, the dissemination of research result and technology adoption was undertaken linearly; from research centers via extension service to the farmer group. The transfer of technology not only took a long time, but also rarely accommodated the feedback from the farmer community.

Since 1995, an Assessment Institute of Agricultural Technology (AIAT) has been established in each of the provinces. AIAT is expected to shorten the transfer of technology to the stakeholders. AIAT has a strategic role in linking research and technology generation to development programs. It is strategic to translate the research results into adaptive research, and to modify based upon stakeholders' feedback. Technology generation and dissemination serves to intermediate between the three important actors (i.e. researchers, extension workers, and farmers).

Within an AIAT office, extension specialists work together with researchers in the same office. While strong interaction in performing innovative activities is necessary for capacity building of community driven technology generation, there are historical and financial tensions between researchers and extension specialists. The hierarchical structure limits collaborative and collegial relations between these main actors in developing innovative activities.

The World Bank and Asian Development Bank joint research projects have improved vertical linkages, between upstream research institutes and AIATs, and horizontal linkages between researchers and extension specialists. The capacity to develop a solid and workable program needs further improvement. For example, the joint program on improvement of cacao productivity and product quality between the Research Institute of Cacao and Coffee in Jember, East Java, with AIAT offices in South Sulawesi and South East Sulawesi. Further capacity building efforts are needed for AIAT to backstop extension workers in the field, by providing extension materials relevant to specific agro-ecological zones and specific agro-business activities.

In the past, rural communities were quite accustomed to adjusting their farming system technology in response to natural and weather conditions, such as late start of rainy season, flood and drought. The traditional capacity is now weakened by the centralized nature of government investment and extension. In the future, AIAT is challenged to develop the appropriate capacity and foundation for weather induced community driven technology generation by identifying the local knowledge, and developing the framework to incorporate such knowledge with scientific endeavor of the research institutes.

A continuously growing agribusiness system will require an integration of ideas from multiple sources and disciplines, integrating crop-specific research to create a holistic vision. Important commodity research needs to continue, but it must be linked to eco-regional and integrated farming systems with sustainability imperatives.

5.4 Challenges and Priorities

Despite the strong emphasis on decentralization, agricultural research must continue to pay attention to the important policy issues of national concerns. The National Agricultural Research System, such as AARD in support of rapid agricultural growth, is expected to develop an agenda to improve the relevancy and efficiency of research programs. The two major agricultural research issues that encompass most challenges are securing an affordable food supply and maintaining environmental standards. Now there must also be emphasis on the more complex research issues of increasing production of high value commodities, including smallholder estate crops, horticulture and livestock.

First, agricultural research must continue to strengthen the agricultural sector capacity to provide access to affordable food for an ever-increasing human population. Increasing food production and the purchasing power of farmers via agribusiness enhancement activities can do this.

The second important challenge is to improve the integrity of the natural resources upon which agriculture and other sectors of economy depend. The involvement of local communities is a necessary condition to successful implementation of soil degradation, water runoff, and water use efficiency in food production.

Third, productivity in smallholder estate crops, horticulture and livestock must b increased. That must include protection against disease and pests. The private sector can take on much of this need, calling for complex mesh9ng of public and private investments in research.

The matrix in Annex 1 provides the relationship between priority research areas and priority commodities in order to support the rapid growth of agriculture sector.

The areas of research and commodities considered may be too broad for USAID to support, as they range from biotechnology to post harvest along four broad (i.e. food crops, horticulture, livestock, and smallholder estate crops.

In the **short to medium term** program, the most critical research area to consider is research on post harvest, which includes quality control for horticulture and smallholder estate crops.

In the **long run** development is needed of:

- The capacity to do research on transgenic product s;
- Overall development policies for bio-technology and for post harvest;
- Policy and regulatory framework need to be developed through stakeholder participation.

Cultivation Area: The major sources of increased food production in coming decades are not likely to come primarily from increased area of cultivation. During the past three decades, the expansion of irrigated area has not significantly increased rice production in Indonesia. In the established area where productivity is already high, the challenge is to improve production efficiency; while in the new expanded area, the challenge is to increase crop yield.

Agricultural Yield: The challenge to close the gap between yield potential and actual yield is as important as the challenge to increase yield potential. However, there has been no systematic and widespread effort to address yield gap in various eco-regions. AIATs are expected to have a key role in enhancing the eco-regional approach in narrowing the yield gap. In addition, collaboration between the national research institutes and International Agriculture Research Centers (IARCs) is expected to enhance yield potential.

Post Harvest Handling: One of the most significant problem in horticultural base agro-business is insufficiency in post harvest handling. Improvement in post harvest handling and quality control may strengthen the competitiveness of Indonesian agricultural commodities in the international market. AARD established the Research Institute on Post Harvest in 2002 to strengthen the linkages with commodity base research institutes and AIATs. This new research institute needs support in almost all aspect of organizational development, such as research infrastructures, human resource development, and strengthening research capacity.

Disaster Response: The recent economic crisis and drought in crop year of 1997/1998 have threatened the ability of the agricultural sector to adequately feed the people. At this critical period, an adequate quantity of food is out of reach to the bottom quarter of the population. Research capacity in managing drought needs to be strengthened in topics such as the predictability of drought occurrences, the management of low flowing water, and disaster preparation.

Integrated Pest Management: Although the orientation of the Integrated Pest Management (IPM) system has already been initiated through farmer based IPM training program, continuing pest management research can contribute to food production and environmental protection goals. Private and public sector collaboration will be essential in the process of enhancing IPM. Although IPM will likely decrease the sales of pesticides, the private sector will develop diagnostic tools and biological control methods more amenable to IPM objectives. IPM research fits within a broader context of Integrated Crop Management and even Integrated Farming System Management.

Water Usage: Growing competition among agriculture, household uses, and industry for the limited supplies of water will force greater attention for efficient water allocation, investment, and use. Farmer participatory action research will improve capacity in water management and water use efficiency.

Swamp Development: Indonesia has a large potential for swamp development, and collaboration with IARCs, such as the International Rice Research Institute and International Water Management Institute, is needed to accelerate the innovation process. In non-irrigated areas, the plant breeding programs need to exploit the potential of modern varieties and to maintain the quality of resource base. Pilot projects in tidal swamp areas demonstrate improvement in productivity through better management of water inflow and outflow in combination with proper soil amelioration. The remaining major challenge is to translate the success into a larger scale investment program, incorporating parameters of a micro-production environment into physical design of canal system.

Biotechnology: Research capacity in biotechnology began in the early 1990s by the establishment of the Research Institute on Food Crop Biotechnology. At about the same time, The National Institutes of Sciences also established Research Center on Biotechnology, and universities such as Bogor Agricultural University (IPB) also developed programs on biotechnology research. The World Bank assisted project helped establish research infrastructures and human resourced development for the AARD system. Since 2002, the scope of activities expanded to include all agricultural commodities. With the new mandates, the name of the Institute changed to Research Institute of Agricultural Biotechnology. The budget for biotechnology collapsed dur9ng the crisis and has only partially r3ecovered in subsequent years.

Table 5.7 Expenditures of the Research Institute on Biotechnology (Thousand US $)

NO	Year	Average exchange Rate (Rp/US $)	Routine	Development	Total
1	1995/1996	2000	1578.81	706.84	2,285.65
2	1996/1997	2300	1554.74	682.13	2,236.87
3	1997/1998	10000	373.64	158.92	532.56
4	1998/1999	12000	256.83	187.89	444.72
5	2000	10000	434.49	286.05	720.54
6	2001	9000	730.97	421.23	1,152.20
7	2002	9000	810.90	479.61	1,290.51
8	2003	8500	861.03	539.14	1,400.17

Strategic Research Areas: There are primarily five strategic research areas included in the Strategic Plan of the research institutes, namely bio-prospecting, bio-processing, bio-safety and food safety, bio-informatics, and tissue cultures.

- Research on bio-prospecting is considered important because of Indonesia's mega bio-diversity, with the potential to provide materials for medicines, fertilizers, pesticides, seeds, enzymes, perfumes, and microbes. The coverage of the research activities includes collection, isolation, exploration, and utilization of the resources for various development activities and human development capacity.

- Bio-processing is meant to achieve efficient production and high productivity in activities, such as bio-fertilizers and bio-pesticides.

- Bio-safety and food safety follow the precautionary approach in using transgenic products. Included in these activities are public advocacy on the rules and regulation, and development of risk-assessment facilities.

- Bio-informatics program are needed for molecular database, sequencing analysis, modeling, and statistical analysis. The research on tissue culture supports the sustenance of germ plasma and the development of new varieties, plant materials, and seeds.

Stakeholders' Participation: Stakeholders' multiple roles emphasize the importance of partnership mechanisms of technology generation and transfer, particularly in feedback and fine-tuning of technologies. The partnership mechanism requires more flexible, fluid organization that focuses upon the flow of knowledge or new ideas throughout the entire innovation systems from knowledge generators to

beneficiaries. At the early stage of development, collaborative activities with partners are too dispersed. Many of them are focused upon a single discipline, and the accumulative flow of knowledge is not reaching to the effective users. Mechanisms to ensure knowledge flows and feasible research need to be institutionalized.

Public/Private Partnerships: Through extensive partnership, the role of the private sector can be enhanced. The public research institutes could concentrate on basic and strategic research, which can offer high returns to the economy as a whole. The benefits multiply as they are widely shared throughout the entire innovation systems..

Chapter 6

AGRIBUSINESS SYSTEM DEVELOPMENT: CONSTRAINTS, OPPORTUNITIES AND RECOMMENDED STRATEGIES

"Agribusiness is defined as the complex of facilities and activities relating to the provision of inputs and services to agricultural producers and processors; the production of crops intended for commercial markets; and the harvest, postharvest handling, processing and marketing of agricultural commodities".

There is consensus among the Consultants that sustained, high level growth in the Indonesian agriculture sector is essential in order to gain widespread increases in family incomes, reduce the level of poverty, and achieve a sustainable rate of economic improvement. (See Dr. Mellor's discussion at the beginning of this report). The team also agreed that the principle factors responsible for rapid growth in the agriculture sector during the 1980s and early 1990s are no longer operative, and that new initiatives will be needed to accelerate future growth.

Achieving higher growth rates in the agriculture sector in future will depend on expanding the production and sales of high value commodities, particularly horticulture crops and livestock and fisheries products, as well as specialty crops such as spices, medicinal herbs, aromatics and others. These commodities can be differentiated according to the degree and type of processing, product form, packaging, labeling, market segmentation, etc.; they lend themselves to value addition; and, unlike basic commodities, they can compete in profitable niche markets on the basis of unique product characteristics.

Expanding production and sales of high value commodities will, however, require significant improvements in agribusiness systems as well as in the policy and regulatory environment in which they function. The rapid improvement of Indonesian agribusiness systems is rendered more critical, and more complex, by the twin influences of globalization and international trade liberalization. Failure to develop and maintain internationally competitive agribusiness systems will not only result in missed opportunities for export, but will ultimately result in the loss of domestic markets to foreign competitors.

As long as the principle focus of national agricultural development remained on rice, with estate crops also contributing significantly to the growth of the sector, there was little perceived need to emphasize the importance of agribusiness. In fact, "agribusiness" did not even enter the lexicon of Indonesian agricultural development policy makers and practitioners until the early 1990s. The significance of the agribusiness sector to overall economic development is becoming increasingly appreciated at the national government level, although strong political support is still lacking.

The challenge for the Government of Indonesia, and for donors, including USAID, is how best to foster the necessary improvements in agribusiness systems and in the policies and regulations affecting those systems, given the limited resources available and the intense competition for these resources. The following discussion examines the constraints and opportunities facing Indonesian agribusiness systems and suggests strategies for meeting this challenge.

6.1 Agribusiness Background

The Ministry of Agriculture is the lead government agency concerned with agricultural production and, increasingly, with agribusiness. Several other Ministries, however, play important roles in various aspects of the agribusiness system. These include the Ministry of Marine Affairs and Fisheries (MMAF), the State Ministry of Cooperatives and Small and Medium Industries (SMCSMI), and the Ministry of Industry and Trade (MIT). The roles of SMCSMI and MIT are particularly significant to agribusiness development, since the former is responsible for farmer and fishermen organizations, including cooperatives, and the latter deals with the agro-processing sub-sector.

Decentralization, or local autonomy, as it is commonly referred to, has shifted the primary decision-making focus to district and municipal governments. The potential benefits of decentralization include greater local accountability for government actions, increased opportunities for participation in government decision-making by the citizenry, and planning that is better adapted to local needs.

There are a number of practical drawbacks to decentralization, however, which tend to be aggravated by the haste with which it was accomplished. Many of the local government units do not have the managerial capacity or the financial and human resource capabilities to effectively carry out their responsibilities under decentralization. The decentralization of government funds disbursement in some cases has also tended to decentralize corruption and make it more difficult to identify and control. Local levies of taxes and fees on all businesses including agribusiness may be exorbitant.

While there are benefits to be gained from local decision-making, there is also a need for overall national coordination in areas such as education, health care, infrastructure planning and implementation and of course, agricultural development. The Ministry of Agriculture is promoting several programs to increase the effectiveness of agricultural research and extension services and make them more responsive to local needs. National government funds have been allocated to new agricultural credit schemes. The degree of support for these efforts varies widely among the districts and municipalities, however. Under decentralization, the central government is forced to rely on persuasion rather than coercion to accomplish its objectives.

6.2 Input Industries

The initial link in the agribusiness supply chain consists of the provision of production inputs, including technical services, to farmers. The main physical inputs consist of fertilizer, pesticides, planting materials, and farm machinery and equipment. A subsidy on fertilizers used for food crops was removed in 1998. This appears to have reduced fertilizer use somewhat, although farmers reportedly tended to apply more fertilizer than necessary prior to the removal.

Indonesia is self-sufficient in fertilizer and produces an exportable surplus. The efficiency of the fertilizer distribution system varies according to location. Fertilizer distribution in Java generally works well, with farmers purchasing fertilizer from private dealers or obtaining it through their cooperatives. In South Sumatra, however, due to adverse road conditions, fertilizer often fails to reach farmers at the time it is needed. Another serious problem in this area is the illegal diversion of fertilizer meant for estate crop farmers to other uses. According to a knowledgeable observer from South Sumatra, these fertilizer distribution failures account for substantial reductions in productivity among small-scale estate crop farmers.

The adequacy of post harvest facilities, particularly for perishable commodities, also varies considerably depending on location. Cold storage facilities and refrigerated vans are available in the peri-urban vegetable and fruit producing areas surrounding Jakarta and around Brastagi, a traditional source of supply for citrus and vegetables. Vegetables and fruits from these areas are marketed in Jakarta and to other urban centers and are exported to Singapore and Malaysia. (Brastagi is located about 70 kilometers northwest of Medan in North Sumatra). Cold chain facilities are generally lacking in other areas of the country.

6.3 Agro-Processing

The most prominent component of the Indonesian agro-processing sector consists of processors of basic commodities, including rice, feed for livestock, wheat flour, vegetable oil, instant noodles manufactured from wheat, as well as initial processing of estate crops. Processing of dairy and livestock products is also important. Many of these agro-processing operations are relatively large in scale (The Bogosari flour mill is the largest such installation in the world). The processing of horticultural products, however, with the possible exception of canned pineapple is generally limited and tends to be conducted by small-scale enterprises. Most processed food products are absorbed by the domestic market. Exports, including those from the horticulture, fisheries and smallholder estate crop sectors, are comprised primarily of raw or semi-processed commodities.

Government policy is aimed at encouraging agro-processing and food preservation at the household, micro and small enterprise level. District and village food processing centers have been established under the auspices of the Ministry of Agriculture in a large number of locations to assist in the development of small-scale agro-processing

enterprises. These enterprises are important in meeting local nutrition needs and providing additional sources of income and employment for rural households.

There is, however, a need to promote more and larger scale processing of high value crops, particularly those from the horticulture and fisheries sector. Increased demand stemming from renewed growth in consumer incomes and the proliferation of supermarkets throughout the country is already prompting significant increases in the production of fruits and vegetables. This in turn results in a larger volume of surplus products at harvest time. More exacting standards imposed by supermarket buyers also mean a higher proportion of fruits and vegetables that do not meet specifications because they are the wrong size, shape or color.

In the absence of processing outlets, these surplus products either command low prices in local wet markets or, more often, must be discarded. Processing would create additional value at each stage of the supply chain from producer to retailer. In most cases the processing enterprises will need to be large enough in scale to meet the quality and volume requirements of international buyers, since export markets will represent the greater proportion of opportunities for processed foods for at least for some time to come. This implies the need for a relatively high level of investment and the ability to establish a reliable supply base to meet raw material volume requirements.

A common response when promoting increases in food processing is "Indonesia is a high cost economy, so it doesn't work". Yet the country has a number of larger agro-processors that survive and prosper. It would be useful to conduct an analysis of what factors are responsible for making it a "high cost economy" for food processors. Is it the lack of a reliable production base, infrastructure deficiencies, graft and corruption, or other factors? If the basic causes can be identified, it should also be possible to identify and apply the appropriate solutions.

6.4 Demand Growth

Improvements in agribusiness systems are dependent on growth in market demand for the products that flow through such systems. The proliferation of supermarkets throughout Indonesia is rapidly enhancing market opportunities for high value food products. This is particularly significant in the case of horticultural commodities.

There has been a rapid expansion in the number of supermarkets since 1997, when this sector was opened to foreign investment. By 2001, hypermarkets accounted for 32 percent of the national retail market, while supermarkets accounted for an additional 33 percent. (Stores with up to 4,000 square meters of land are classified as supermarkets, while hypermarkets are allowed 8,000 square meters; these limits are not strictly enforced, however.) For purposes of this report all of these larger retail stores will be referred to as supermarkets. By 2002, 11 supermarket chains were operating more than 680 outlets nationwide (although the majority of these were located in Jakarta). The competition fostered by the entry of foreign-owned supermarkets into the Indonesian market has prompted Indonesian retailers to expand

their businesses and upgrade their product standards. This expansion of the supermarket sector is accelerating.

The growth of supermarkets is fueling parallel growth in horticultural production and trade. The quality demands posed by the supermarkets are also raising quality standards throughout the horticulture sector. An example of the progress being brought about through the expansion of demand by supermarkets is the organization of horticultural production and trade in the Bogor area, near Jakarta. Traders supplying Jakarta supermarkets and at least one airline catering service are organizing groups of vegetable and fruit growers, helping the growers access production credit, providing them with technical advice and putting up small depots where produce is sorted, cleaned and wrapped in plastic.

One trader/collector is putting bar codes on his vegetables at the field collection point, for delivery to Carrefour supermarkets. Another has obtained HACCP (Hazard Analysis and Critical Control Points) accreditation in order to market lettuce to McDonald's. A third is pre-processing vegetables for export to institutional buyers. A typical trader under this system has contractual arrangements with 25 or 30 groups of about 25 farmers each.

The ability to meet improved domestic supermarket standards for fresh produce will help create additional opportunities for export. Citrus and vegetable producers in the Brastagi area have traditionally exported oranges, fresh potatoes, cabbage and carrots, packed in wicker baskets, to Singapore and Malaysia. Illustrative of newly found opportunities, however, is the recent establishment of a Japanese-invested joint venture near Brastagi, with a large cold storage facility and modern packinghouse for export of fresh vegetables to Japan. This company contracts for 80 to100 ha. of assorted vegetables each month, procuring these vegetables on a rotating basis from several hundred small scale growers in the area.

As earlier stated, future Indonesian agribusiness growth will be led by the high value crop sectors, principally horticulture, livestock, fisheries and smallholder estate crops, which represent the most favorable potential for substantial growth in demand. In the judgment of the Consultant, however, within the high value crop category, improvements in the agribusiness systems serving the horticulture sector should provide the greatest impact and the most immediate returns. Thus this chapter, while it will focus on the improvement of agribusiness systems generally, will emphasize the horticulture sector.

6.5 Farmer Integration into Agribusiness Systems

Indonesia is one of the few, and perhaps the only, developing country that has institutionalized formal buyer-supplier relationships between small scale producers (farmers and SMEs) and larger firms, including agribusiness firms. A "partnership" law regulating these relationships was enacted in 1997.
There are a number of success stories of agribusiness companies working with large numbers of small-scale farmers under the partnership system, although some of these

have encountered major difficulties in implementing the concept. Among the successful partner firms, but by no means the only ones, are Charoen Pokphand in poultry and the Carrefour and Hero supermarket chains. A number of these schemes have failed, however, for various reasons (see the "Constraints" section below).

The partnership approach, or the Nucleus Enterprise Model (NEM), as the Consultant prefers to term it (see Part I, Annex 3), can serve as a valuable tool for integrating small scale farmers into commercial agribusiness systems. The NEM can be defined as "any agribusiness firm or organization that has assured markets for an agricultural commodity, that needs additional raw or semi-processed commodities to supply these markets, and that is willing and capable of transferring technology, providing technical advice and acting as a conduit for credit to small-sale farmers in order to obtain a reliable supply of the commodity".

The NEM if properly organized and implemented provides significant benefits to both parties to the partnership. It assures the participating small-scale farmers of markets for their commodities and provides them with the technical skills and operating credit required to meet the specifications established by these markets. It ensures the nucleus enterprise a reliable supply of commodities that meet their marketing needs.

Supply Chair Organization

Individual farmers and small and medium scale agribusiness firms are disadvantaged in dealing with the general society.

- They lack bargaining power in the marketing of their products and in the purchase of necessary input supplies.
- They lack a strong voice in advocating policy and regulatory changes.
- Providing them with adequate technical and marketing information is complicated and costly.
- Effectively integrating individual participants into the agribusiness supply chain is difficult and sometimes impossible.

Even larger agribusiness companies may lack the political influence required to successfully gain changes in adverse policies or regulations. The most viable means of correcting these disadvantages is through the establishment and strengthening of business support organizations (BSOs) at all levels of the agribusiness supply chain and the fostering of strong links between supply chain BSOs operating at different levels.

BSOs include farmer organizations, trade and commodity associations, chambers of commerce and others. A major benefit to be gained from developing effective agribusiness organizations is the role these organizations can play as conduits to their members for many of the inputs that are needed for agribusiness systems improvement.

6.6 Agribusiness System Constraints

There are a number of significant constraints to the further development and growth of Indonesian agribusiness. The overarching constraint is the ***lack of adequate investment*** in the agriculture sector, including public sector investment, domestic private investment, and foreign direct investment. This lack of investment results from some of the constraints and is the root cause of others.

Indonesia in terms of natural resource endowment and low cost labor should have a significant comparative advantage in agriculture, but the lack of adequate investment in the agriculture sector is increasingly constraining the ability of Indonesian agribusiness to be internationally competitive. A continuation of this trend will eventually result in the marginalization of Indonesian agriculture and its relegation to a subsistence level with an attendant increase in poverty. In this era of globalization and rapid world-wide trade liberalization, an internationally competitive agribusiness sector is essential.

The economic problems stemming from the financial and political crisis that began in 1997 have been an important factor inhibiting increased public sector investment in agriculture. ***Political uncertainty*** and ***security problems*** act as a deterrent to both private domestic and foreign direct investment. Security refers not only to overt terrorist activity, but more commonly to widespread thievery of agricultural commodities by organized gangs in rural areas.

One of the disturbing aspects of the current political situation is the apparent ***lack of a constituency*** for agricultural development among the more than 100 political parties preparing to compete in the elections scheduled in 2004. This provides another important rationale for developing effective agribusiness support organizations with the capacity to influence policy decisions through informed advocacy.

An important factor constraining further agribusiness development is the ***low educational level*** of most farmers, whose formal schooling generally averages three to six years at the elementary level. An average of one farm youth in ten attends secondary school. The low level of education makes it difficult for many farmers to understand and apply new technology. Farm youths who manage to gain a better education generally leave the farm to seek employment in urban areas.

Deteriorating rural infrastructure, particularly roads and irrigation systems, is a problem throughout the country and has become a significant constraint to agribusiness development. It was also reported to the Consultant that for political reasons, many roads in rural areas were originally built to substandard quality, leading to even more rapid deterioration. Decentralization has shifted the responsibility and the funding for most rural infrastructure to the local (district) level, making it difficult to determine with any degree of reliability the actual extent of support for infrastructure development and rehabilitation.

There are numerous examples of the adverse economic effects of deteriorating infrastructure. A Brastagi-based trucking company that transports large quantities of citrus to Jakarta on a regular basis reports that travel time from Brastagi to Jakarta has increased in recent years from 2.5 to almost five days due to increasingly poor road conditions. This seriously inflates marketing costs for the farmer-shippers.

The ability of farmers and agribusiness enterprises to ***identify and access markets*** needs to be improved. There is very little timely market information available to agribusiness enterprises or to farmers, particularly for high value crops. The growth of supermarkets in recent years has prompted better coordination between final product buyers in the domestic market and intermediate traders and small-scale farmers. Export marketing of fresh horticultural commodities, however, is still carried out by traders and grower/collectors who have typically been in business for quite a long time and have established ongoing relationships with their foreign buyers.

Improvements in horticultural productivity and product quality should provide future opportunities for increasing exports of these products. Taking advantage of these opportunities will require identification of new markets and buyers, continuing access to market intelligence and analysis, and the carrying out of regular trade promotion activities. Establishing and maintaining effective export marketing systems will require close cooperation between the government and the private sector.

The government should be positioned to carry out several important activities related to the promotion of agricultural exports. Commercial and/or agricultural attaches serving abroad are well placed to gather market intelligence and forward it to their Ministries. The most efficient channels for disseminating this market intelligence to exporters, traders and producers are the relevant trade or commodity associations. Government generally does not have the broad range of industry contacts nor the appropriate systems in place for timely dissemination of market intelligence and information to end users.

In order for this system to work, however, attaches must be well briefed on their intelligence gathering role and formal links must be established between their headquarter offices and the relevant associations. The communications must flow both ways, from the attaches to the associations through the Ministry and from users of the information to the attaches to inform them of industry information needs.

Another important role of government is to help initiate industry participation in foreign trade expositions and trade missions and to handle the logistic arrangements for these. Government or donors may initially subsidize a portion of the cost for the participation of private sector representatives in these activities. In most cases, however, subsidies are phased out as soon as the private sector is convinced of the benefits to be gained through participation.

Agribusiness systems (including commercial agricultural production) require constant renewal of appropriate ***technology*** if they are to become, and remain,

internationally competitive. The Indonesian research system, which should serve as the primary technology source for agribusiness, suffers from several problems that are common to many developing countries.

- The agricultural research system is seriously under-funded.
- Research has historically been based on government dictates or researcher priorities rather than on user needs.
- There are few links between researchers and farmers, and between researchers and extension workers.
- Research results are often reported using terminology that makes them inaccessible to farmer-users.
- Potential users of research results generally do not have an opportunity to participate in decisions regarding research priorities.

Attempts are being made to solve these problems. There is an effort underway currently to develop joint research and extension units at provincial level, in a bid to establish better cooperation between researchers and extension workers as well as to institutionalize the participation of users in determining research priorities.

The agricultural research and extension systems in the past have focused almost entirely on improving agricultural production. Providing improved production technology to farmers is no longer sufficient, however. Improving agribusiness systems requires improvements in post harvest practice and facilities, in marketing, in quality control, in supply logistics and in many other areas beyond the scope of production technology. Providing these improvements through enabling the acquisition and application by agribusiness enterprises of up-to-date technology will necessitate the retooling of both research and extension capabilities.

The rapid ***expansion of supermarkets*** is creating a premium domestic market for higher quality food products. There is a very real danger, however, that unless the Indonesian agribusiness system can deliver a reliable supply of domestic products of the required quality at competitive prices, this market will eventually be pre-empted by foreign suppliers (this has already happened to a significant extent in the Philippines).

Sophisticated ***quality control*** is a primary requirement for acceptance of food products in foreign markets and is becoming increasingly important for domestic markets due to the growth of supermarkets, fast food chains and five-star hotels with their stricter quality standards. Agricultural exports must also meet certain quality standards. Most Indonesian agricultural commodities are sold in raw or semi-processed form in both domestic and export markets. Lack of adequate post harvest facilities, inadequate transportation infrastructure and a general absence of means for monitoring quality control make it difficult for many Indonesian agricultural commodities to meet the standards set by domestic supermarkets and cause them to rank at the low end of the quality and value scale in export markets.

Indonesian agribusiness with the exception of a few locations lacks appropriate ***post harvest facilities***. This is particularly critical in the case of high value perishable

commodities such as horticulture, fisheries, meat and dairy products. Estimates of average vegetable losses in transit to market range from 30 to 60 percent. The quality of those vegetables that do reach the market is often substandard. Losses and quality deterioration in transit are primarily due to the lack of functioning cold chain systems as well as poor road conditions.

The Consultants have received mixed reports concerning the ***cost of credit*** to small scale farmers and rural small and medium agribusiness enterprises. There is general agreement that the present interest rates are not conducive to intensive high value crop production or to the profitable operation of agribusiness trading enterprises. The numbers, and scope, of both types of operation are continuing to increase, however, despite interest rate levels.

High commercial interest rates represent a macro-economic problem that stems from the commercial banking sector's needs to recapitalize as a result of the high level of non-performing loans that were both a cause and a result of the financial crisis that began in 1997. There are reliable indications, however, that interest rates will be lowered in the near future.

The ***availability of credit*** is evidently still a problem, although the level of lending to rural SMEs is increasing. The central government has instituted several new credit schemes for SMEs and micro-enterprises as well as small-scale farmers and rural agribusinesses. Certain of these schemes are not yet widely implemented, however, due to difficulties in rendering them operational at the district level.

Indonesia has already instituted a number of ***policy*** changes favorable to the further development of agriculture and agribusiness. The maintenance of these policies and their proper implementation need to be monitored and new policy issues addressed. Building the capacity of farmer and agribusiness associations to effectively engage in policy analysis and advocacy will be an important contribution to this task.

There are still a number of policies affecting agriculture and agribusiness that need to be reviewed. There is a need to protect small scale farmers from being exploited by larger agribusiness firms. The existing ***partnership approach***, however, which is given legal status under the Small Enterprise Law No. 9/1995 and the Partnership Law No. 44/1997, is fine in concept. However, in actual practice, it is often used arbitrarily to pressure agribusiness investors into assuming uneconomic obligations that act as a deterrent to achieving the stated goals. Application of the laws has in many cases led to abuses by participating agribusiness firms, who accept the requirements as a condition for obtaining their investment approval, then figure out ways to circumvent the law, leaving their partner small scale farmers in worse condition than they were before entering into the partnership. Thus the law and in particular, its application, rather than facilitating the profitable integration of small-scale farmers into agribusiness systems, has the opposite effect.

The partnership laws need to be thoroughly analyzed and extensive changes made. Ideally, the partnerships, or nucleus enterprise models, should be made voluntary, with incentives provided for those agribusiness firms that enter into productive

partnerships with small scale farmers and provisions made for standardized partnership agreements and for monitoring the partnership relationships.

The ***agricultural extension service*** was relatively effective in transmitting the technical advances of the Green Revolution to Indonesian farmers. During the past decade, however, extension has been rendered increasingly ineffective due to lack of budgetary support and the inability of the organization to keep up with technical developments in commercial agribusiness. This lack of effectiveness has been exacerbated by decentralization, which has transferred the responsibility for extension field activities to district and municipal governments.

The application of technical extension for purposes of improving agricultural production is no longer sufficient for the improvement of the agriculture sector. Extension agents need to be well-versed in biotechnology, marketing, institution building, the facilitation of participatory decision-making and other subjects only peripherally related to agricultural production.

Government supported extension services are rapidly becoming irrelevant throughout the developing world, for two main reasons. Governments subject to severe budget limitations and ever increasing demands for a wide variety of services are no longer able to provide adequate financial support for a large agricultural extension organization; and traditional government extension services are unable to keep abreast of agriculture sector needs, particularly in an era of rapidly changing technology and markets. Internationally, the trend is toward promotion of alternative mechanisms for extending technology to farmers and other participants in the agribusiness system. These mechanisms include, among others, technical services extended by:

- Agribusiness firms acting as "nucleus enterprises";
- Field men for production input suppliers and agro-processors;
- Extension agents employed by grower associations (the Taiwan model);
- Professional consultants compensated through user pay schemes.

The government needs to recognize this trend and to adopt appropriate policies and mechanisms to support a rational refocusing of extension efforts.

The current national ***quarantine system*** is not functioning properly. There is reportedly rampant smuggling of certain commodities into the country. Quarantine regulations and procedures need to be reviewed and the skills of quarantine personnel upgraded.

Indonesia has a ***seed certification system*** in place, but it is not being properly enforced. Implementation of quality control measures for imported planting materials is for practical purposes non-existent.

Analytical facilities and procedures for testing export commodities are woefully inadequate. Fresh produce exported to Singapore, Japan and other international markets is routinely destroyed at destination due to excessive pesticide residues.

Detention rates for some of the smallholder estate crops exported to the U.S. and Europe are quite high. The lack of analytical facilities represents a potentially severe constraint to the expansion of fisheries products exports.

Stronger emphasis is needed on improving ***police capability*** to combat organized thievery of agricultural commodities in rural areas. The lack of security is a significant disincentive to improvements in agricultural productivity in some areas of the country.

Policy measures leading to the rapid formation, strengthening and effective operation of ***agribusiness support organizations (***associations, etc.) needs to be instituted. The enactment of an association code of conduct stipulating measures to ensure broad based, representative membership, control by private sector participants, and regular rotation of board members and officers may be needed.

There is an urgent need to develop private agribusiness sector capabilities for effective ***policy advocacy***. This need is particularly acute in view of the previously mentioned lack of a national political constituency for agricultural development. One of the necessary preconditions for effective advocacy is the existence within the non-government sector of professional capacity for in-depth ***policy analysis***.

A start has been made toward addressing local policy analysis needs through the regional university outreach program initiated under the USAID-sponsored Food Policy Project. The current focus of the university policy research network is on assisting local governments to devise and implement appropriate policies under the decentralized system. A logical extension would be the initiation of cooperation between the university network and agribusiness trade associations, in order to help develop broad-based policy advocacy within the private agribusiness sector. A tri-partite policy advocacy alliance between the university network, associations and local governments might be beneficial in addressing local agribusiness concerns.

Opportunities

Indonesia's primary comparative advantage lies in the country's abundant natural resource endowment and relatively low cost labor. The rapid spread of globalization and international trade liberalization are making it increasing critical for Indonesia to translate this comparative advantage into competitive advantage at the agribusiness firm and farm level. Failure to do so will not only negatively impact on the country's export potential, but will also open up domestic markets to greater external competition. Provided Indonesian agribusiness systems can be made internationally competitive, however, the enhanced opening of world markets to agricultural product imports represents promising opportunities for agribusiness growth.

Achieving agricultural and fisheries competitiveness will require rapid improvement in the country's commercial agribusiness systems as well as the integration of small scale farmers into these systems. Successfully accomplishing this task will in turn help satisfy the larger goals of enhancing income growth and reducing the incidence of poverty.

Improving agribusiness systems should ultimately impact favorably on all categories of agricultural commodities. The most immediate and most significant, impact, however, will likely be the facilitation of more rapid growth in the production and sales of horticulture, livestock and fisheries products. Smallholder estate crops are also a potentially promising area for growth. Agricultural growth is based on growth in market demand for agricultural products. As the nation continues to work its way out of the financial crisis and consumer disposable incomes rise, the above high value commodities should exhibit the most rapid increases in consumption.

6.7 Suggested Strategies

The confluence of several important elements in the current Indonesian environment as well as global developments in the food and agriculture sector during the past decade provide the rationale for placing emphasis on the development of the nation's agribusiness systems, with particular emphasis on high value commodities. Among the local elements:

- The Asian Economic Crisis illustrated the economic importance of Indonesian agriculture, which was the only major economic sector to exhibit positive growth in value and increases in employment in the immediate aftermath of the Crisis;
- Indonesian agriculture/agribusiness has a comparative advantage in terms of natural resource endowment and low cost labor.
- The dual agricultural development thrusts of the Government of Indonesian consist of (i) a development program for expanding the agricultural business (agribusiness) system; and (ii) a development program for the creation of food security;
- Unlike the situation in the 1980s, rice will not provide the momentum required for the increases in agriculture sector growth that will be required to produce significant increases in rural income and play an important role in rural poverty reduction;
- There is significant domestic and foreign market potential for Indonesian horticultural, livestock and fisheries products, provided the agribusiness sector can establish and maintain international competitiveness;

Achieving equitable growth in the agriculture sector will require the existence of effectively functioning agribusiness systems. Such systems will also foster the establishment of a variety of off-farm agribusiness enterprises that will in turn provide increased employment and enhanced economic growth prospects. Effectively functioning agribusiness systems will improve the opportunities for estates and other large agricultural production units, but they will provide substantially more benefits to small and medium scale farmers. Competitive, effectively functioning agribusiness systems will be essential to enabling Indonesia to adequately cope with globalization and trade liberalization, the two most important worldwide trends affecting the agricultural competitiveness of individual nations.

The Consultant suggests the following specific strategies for improving Indonesian agribusiness systems.

1. ***A concerted effort should be mounted to change those policies that are detrimental to the rapid growth of the agriculture/agribusiness sector (see the Constraints section above). This effort should include measures to enhance the policy advocacy capabilities of private sector agribusiness system participants through their associations.***
   This effort should be led by private sector stakeholders including associations of small-scale farmers and enterprises and larger agribusiness firms, and should involve participants from the regional university policy outreach network, local government officials, and expert advisors from the central government and from donor organizations. It should be based on the results of a comprehensive study of current government policies and their effect on agribusiness growth and competitiveness. A significant aspect of this activity is the fact that it would be spearheaded by organized pressure groups from within the private agribusiness sector. This will necessitate the expansion and strengthening of agribusiness support organizations (farmer groups, trade and commodity associations, etc.) and building their capacity for policy advocacy.

2. ***The central government should encourage and assist district governments to prioritize and coordinate their transport infrastructure planning.***
   Rural transport infrastructure constitutes a major constraint to agribusiness systems improvement and to the development of international competitiveness for Indonesian agriculture. Given the extent of the improvement needs and the limited resources of government, the most significant economic impact will come about through identifying production areas with the greatest potential for increasing market volume and value and placing priority on improving the transport infrastructure connecting these areas and their markets. This approach will not only benefit agribusiness activities, it will also facilitate the marketing of handicrafts, light manufactures and other local products. (This is related to the following recommendation).

3. ***Comprehensive agribusiness systems improvement programs should be initiated in selected areas (cluster strategy).***
   Regardless of the outcome of the 2004 national elections, enactment of the recommended policy changes will most likely depend on their approval by legislators who may not allocate a high priority to agriculture sector development. One means of obtaining that approval will be to identify micro policy needs at the local, operational level and demonstrate to these legislators, and to other decision makers, the benefits that will accrue to the nation from improvements agribusiness systems at this level. (This should also facilitate donor participation). The Indonesian economy, however, cannot finance the full cost of developing agribusiness systems nationwide. The limited resources should be used instead to encourage additional investment from the private sector by dedicating a significant proportion of

available government and donor funds to the improvement of agribusiness systems in a limited number of growth clusters throughout the nation. This will assist the farms and agribusiness firms in these clusters to become internationally competitive, will attract additional private sector investment into these areas, will provide a better understanding of constraints to agribusiness systems development at the operating level, will demonstrate to policy makers the gains to be realized from agribusiness sector improvement, and will create development models for future replication elsewhere. The selected clusters will also provide commercial laboratories for field trials of new technical and social initiatives, such as the application of biotechnology to crop improvement.

The most immediate impact from pursuing a cluster growth strategy will be in the horticulture sub-sector. It is relatively easy to identify prospective horticulture clusters, based on an existing mix of high value horticulture crops, availability of markets, local government support and the presence of a sufficient number of farmers and agribusiness firms that are willing and capable of benefiting from cluster development. The selected clusters must be extensive enough and cover a broad enough geographical base to enable the development of diversified, integrated commercial agribusiness systems based on participation by entire communities. The level of government and donor support provided to these growth clusters should, however, be carefully calibrated to ensure that they not so extensive and pervasive that it will be difficult to replicate them in other areas.

The potential growth clusters already identified by the Consultant include Malang in East Java, Brastagi-Medan (with the possible inclusion of Aceh) in North Sumatra, Manado in North Sulawesi and Bogor in West Java. A comprehensive study will need to be conducted to identify other alternatives. The approach to cluster support will differ significantly according to the needs and opportunities found in each cluster.

4. The development and strengthening of a greatly expanded system of agribusiness support organizations should be encouraged through the provision of technical assistance and financial incentives.

Reaching small-scale farmers and small and medium agribusiness enterprises on an individual basis is a practical impossibility. The most viable solution is through the development of associations or other forms of participatory organization. These organizations should evolve on the basis of private sector participant needs. (Experience has shown that private sector organizations established through government mandate and/or with government funding are not sustainable). Associations in addition to serving as effective policy advocacy groups can act as conduits for skills training, as agencies for transmitting market and technology information, as instruments for achieving industry consensus and coordination as well as serving other goals that require industry-wide participation.

5. ***The nucleus enterprise or "partnership" model should be actively encouraged as a means of integrating small-scale farmers into the agribusiness system, helping them to achieve international competitiveness, and encouraging medium and larger scale agribusiness firms to invest in agribusiness (provided the necessary changes are made in the laws governing the implementation of the partnership system).***
This may require changes in the current partnership regulations in order to ensure that they meet agribusiness enterprise requirements. A revised law, however, should continue to define acceptable conditions for contracts between producers and agribusiness enterprises and should provide for regular monitoring of the nucleus enterprise models as well as arbitration procedures in case of a dispute between the nucleus enterprise and participating producers. Agribusiness enterprises and small-scale growers, through their associations, should play an active role in determining NEM contract provisions (see Annex 3 for a more detailed discussion of the nucleus enterprise model). The nucleus enterprise models will serve as a conduit for dissemination of technical information, skills training, and credit to farmer participants, supplementing ineffective government extension services and facilitating credit distribution and repayment.

6. ***A suitable academic institution should be identified and encouraged to develop a center for the research and development of agribusiness supply chain management (SCM) within the agribusiness sector***
Agribusiness supply chain management deals with the effective coordination and improvement of product flow from the farm to the consumer. While the physical logistics of product flow constitute one element of supply chain management, the more important aspects deal with relationships between the various participants in the supply chain. The ultimate purpose of supply chain management is to help realize competitive advantage. Development of efficient supply chains can make a significant contribution to the achievement of internationally competitive agribusiness systems as well as better serving domestic consumers. The private agribusiness sector should actively participate in the design of an agribusiness SCM center and should contribute substantially to its sustainability through fee based training and direct financial support.

7. ***National and local governments, universities and donors should assist in the development of skills training programs for small and medium scale farmers and their families***
Facilities for transferring technical skills to farmers are generally inadequate. Where these facilities are functioning, the skills are often inaccessible to the farmer due to his or her low level of education. Special programs are necessary to train poorly educated farmers in basic farming skills. The primary emphasis should be on transferring production and post harvest handling skills for high value crops. This will also promote increases in the competence of agricultural training and extension personnel for facilitating the commercial shift by small-scale farmers into higher value commodities. These programs should also incorporate training in rudimentary life skills,

such as family financial planning, as part of their farming skills training. The programs could be housed at and trainers sourced from, local elementary and high schools, universities or local government offices. An internship program for farm youth should also be incorporated into the programs, with the cooperation of local and national agribusiness firms.

8. ***National and local governments, universities and donors should assist in the development of sustainable, locally based business development service (BDS) providers for small-scale farmers and rural SMEs.***
Access to markets and availability of credit are two important prerequisites for agribusiness development, but basic business skills are needed to make effective use of both markets and credit. Small and medium scale commercial farmers and rural SMEs often lack these skills. The preferred approach is to help develop financially sustainable, private commercial BDS providers in the rural areas. These providers may require some initial subsidization. The subsidization, however, should be in the form of assistance for assessing BDS needs and for promoting BDS services, rather than direct subsidization of client services. One approach to the provision of support would be for local governments or donor projects to contract with the BDS provider for the training of those micro and household entrepreneurs who cannot initially afford to pay user fees.

9. ***Steps should be taken to introduce check off systems for key commodities in order to generate funds for industry improvement, including research, market promotion, human resource development and others.***
The check off is an organized system for deducting a small percentage of the price paid for each product sold and applying the resulting revenues to the solution of industry needs. Even a very small percentage of the sales price (for example, less than 1%) when applied to all of the producers of a particular product or class of products can generate substantial revenues. Separate check off systems are organized for separate industries.

Check off systems have become the primary means of funding agricultural commodity industry improvement in the United States and a number of other developed countries. The most active check off programs in Asia are found in Japan and Korea. While most developing countries in Asia have not yet adopted the check off system, it would appear to be a promising solution to many of the most pressing agribusiness industry problems.

In order to be successful, a check off introduction program must include the following elements:

- The development and strengthening of industry associations, which are the essential foundation for the check off system;
- Recruitment of a group of industry "champions" who will promote the adoption and implementation of the system by members of each industry;

- An organized effort to educate enterprises, industry leaders, politicians, government and others concerned about the benefits, operations and essentials of check off systems;
- Legislation or regulations making each check off system mandatory and establishing operational processes and procedures, including severe penalties for non-compliance;
- An official (government) body to oversee the operations of the system;
- The constituting of a board made up of the owners/managers of firms within the industry, who are elected by designated representative of all of the firms participating in the check off, through elections managed by the relevant industry association and monitored by the oversight agency, and who serve for a fixed and limited term;
- Transparent procedures for involving all participating enterprises in the setting of spending priorities and the selection of projects for implementation that fit within those priorities;
- Arrangements for government to provide funds to the industry boards on a matching basis (advisable but not mandatory, may be for limited period to assist in startup of activities);
- The adoption of required procedures for periodic auditing of the expenditures and activities of the industry board.

As mentioned above, the primary problem facing small scale farmers and their industry associations is the lack of funds with which to address critical problems in the production and marketing of their products. One of the prime examples is research and extension, carrying out constructive activities on behalf of industry participants. In developing countries such as Indonesia, the first reaction of government is usually to provide the funds required for small farmers to address their more pressing problems, usually on a subsidized basis. Often the source of these funds are various donors who have the same development goals as the government.

Government, and donor, funds, however, are limited, and cannot normally address all of the problems faced by farmers. They also come with conditions attached, conditions mandated by the donors and by the government agencies through which the funds are channeled. These conditions are often not in the best interest of the small scale farmers that are the targeted beneficiaries of the funding programs. Another common fault encountered with government funding is the amount that is siphoned off through various forms of corruption.

Utilizing the small farmers themselves as the source, and management, of the funds accomplishes several very worthwhile objectives. It ensures, first, that the activities made possible by the funds are those that the farmers themselves want, and need. The provisions for transparency and for auditing make it more difficult, if not impossible, for the funds to be siphoned off through corruption.

The fact that the funds are contributed by the farmers themselves, not by the government or by other sources, ensures that the farmers, and the industry as a whole, take ownership of the activities financed by their money, and actively participate in the setting of program priorities as well as utilizing the benefits. An example of a set of activities that could be financed by the check off system is the establishment and operation of systems for carrying out farmer-directed applied research, with the farmer organizations providing part or all of the funding and the research institutes furnishing the facilities and research personnel.

Annexes

Annex 1. Priority Matrix for Research & Technology Generation

Commodity / Research Area	Food Crops		Horticulture			Livestock		Smallholder Estate crops		
	Rice	Corn	Vegetables	Fruits	Ornamental	Poultry	Beef Cattle	Medicinal and spices	Coco nut	Coco a
Post Harvest Farming system :			***	***	***					***
• Crop-livestock	**	***	***	**		**	***		***	***
• Inter Cropping	**	***	**	**						
• Conservation farming										
• Crop-fishery										
Integrated Crop Management :										
• IPM/ICM	***									
• Agro ecological zoning			**	**						
• Nutrient and feed Management	**					***	***			
Breeding and Seed Improvement:										
• Breeding	***	***	***	**	*	**	***	*	*	*
• Tissue Culture			***	***	**					
Bio Technology:										
• Bio fertilizers and pesticides	***	***	***	***				***		
• Bio prospecting			***	***						
• Bio Processing		**								
• Bio and Food Safety								**		
• Bio Informatics										

* low ** intermediate *** high priority

Annex 2. Brief Reviews of the Stages of Agricultural Development

Since early 1970's the initial phase of intensive development program, various policies both macro and agriculture sector specific have been implemented to foster agricultural growth. There are several milestones that have to be considered in assessing the impact of the policies particularly in relation to the role of technology.

First, the period between 1970 and 1984 was characterized by heavy government support to agricultural development in general and irrigated food crops in particular. This period was also characterized by introduction of green revolution technology, initiated by the new released IRRI varieties IR -5 and IR-8 through the rice intensification program (Bimas Program) in almost all irrigated areas in Indonesia. By 1980's irrigation investment accounted for more than a half of the public expenditures on agriculture and irrigation with publicly funded irrigation accounted for more than 85 % of irrigated area and 75 percent of the country's rice production. (Rosegrant and Pasandaran,1995). Large amount of resources were put in place to ensure that production inputs were accessible and affordable by farmers in all parts of the country among others are input price subsidy and national delivery scheme for fertilizers throughout the country. Along this line, specifically for rice, farmer's income was ensured by guaranteed price scheme. During this period productivity of rice were continually increased, As it is shown in table 1 the share of the growth of productivity of rice to the growth of rice production during this period is much higher than the share of the growth of harvested area.

Annex 3. Donor Programs Related to Agriculture and Agribusiness

Donor	Assistance to the agriculture and fisheries sectors
World Bank	The World Bank Country Assistance Strategy launched in February 2001 is not specific to the agriculture or fisheries sector, but is based on rural development for alleviating poverty. The approach is shifting from supporting technical matters in agriculture and natural resources to support for institutional concerns including micro-finance. The World Bank also supports the empowerment of farmer's groups in the context of rural development.
Asian Development Bank	ADB country strategy for 2001-2005 includes five components: 1) Strengthening basic institutions through improved governance; 2) Enabling and encouraging private sector development; 3) Balanced regional development; 4) Human and social development; and, 5) Strengthening environmental management. While agriculture and fisheries are related to these areas, the focus is on social development, poverty alleviation and environmental issues.
Japan International Cooperation Agency	The Japanese agriculture and fisheries sector assistance program for 2003-2005 comprises: 1) Improving the institutional and production support systems for agriculture; 2) Improving agricultural infrastructure and sustainable operation and maintenance; 3) Sustainable utilization of fisheries resources; 4) Promotion of community-based economic activities in agriculture; and, 5) Improving markets for agriculture and fishery products.
Food and Agricultural Organization of the United Nations	FAO-related projects tend to target important issues that cover the entire area of agricultural development in Indonesia, including a structural adjustment program aimed at helping restructure government organizations; a national program for food security; and a food safety program.
UNDP and other UN Agencies	UNDP and other UN agencies emphasize community development, governance, environmental management, assistance in implementing international environmental conventions and labor. The main assistance to the agricultural and fisheries sectors is in the form of funding for community development.
Australian Agency for International Development (AUSAID)	AUSAID extends assistance to the agriculture and fisheries sectors as a part of its overall rural development strategy.
German Technical Cooperation Agency (GTZ)	GTZ provides assistance to the agriculture sector through capacity building for local government and community empowerment.

Annex 4. An Introduction to Agribusiness

There are a number of definitions of agribusiness. The one that will be used for purposes of this report is "the complex of facilities and activities relating to the provision of inputs and services to agricultural producers and processors; the production of crops intended for commercial markets; and the harvest, post harvest handling, processing and marketing of agricultural commodities".

This definition is broader than some others, including as it does the commercial producer. Increasingly, however, commercial farmers if they are to survive and prosper must become businessmen (or business women). Also, the type, quantity and quality of commodities that these commercial farmers produce are important determinants of the nature and functions of the agribusiness supply chain, from production input suppliers to markets.

The complex of facilities and activities referred to above is more properly known as the "agribusiness system". There are actually a myriad of agribusiness systems, with the characteristics of each system determined by the crop, the type of farming system and the targeted market or markets. Certain components of the different systems, however, may be the same or similar. For example, all perishable products, whether meat, dairy products, fresh fruits, vegetables or others, require a functioning cold chain in order to ensure maintenance of quality from producer to consumer.

Professor Ray Goldberg of Harvard University coined the term "agribusiness" approximately four decades ago. A 2002 publication by the Indonesian Ministry of Agriculture contains a 1957 quote from Davis and Goldberg (Ministry of Agriculture 2002). "The agricultural world and the industrial world are not two separate economies having merely a buyer-seller relationship. Rather, they are so intertwined and inseparably bound together that one must think of them jointly if there is to be any sound thinking about either one or the other".

There is a growing realization on the part of many developing country governments as well as the donor community that the development of a dynamic agriculture sector provides the most viable means for realizing broad-based, equitable economic growth, particularly in those countries with the majority of their population in the rural areas. In order to achieve the desired results, this growth must be market driven and fostered primarily by private sector investment, with the government playing a supportive and regulatory role rather than participating directly.

Increasing global competition brought about by the proliferation of multilateral trade and economic groupings and the significant tariff reductions begun under WTO, AFTA and other trade liberalization pacts are reinforcing the basic shift in agricultural development from production to an emphasis on integrated agribusiness systems. Developing country policy focus is changing from an emphasis on food self-sufficiency and specific crop production targets combined with pervasive government intervention, to becoming internationally competitive through demand driven, diversified crop choices implemented by private sector decision-making. This can only be accomplished through the development of effectively functioning agribusiness systems. (One reason for the emphasis on international competitiveness for farmers who supply domestic markets is the fact that trade liberalism is enabling external suppliers to more easily enter these markets).

The successful establishment and operation of effectively functioning agribusiness systems entails a number of essential elements. These include:

- A conducive policy environment;
- The public infrastructure required to efficiently produce and distribute agricultural commodities (roads, bridges, port facilities, telecommunications, connections to sources of electricity and water, irrigation facilities, etc):
- A reliable production base;
- Competitive access to profitable markets;
- Broadly representative private sector business support organizations (BSOs) at all levels of the agribusiness supply chain; and,
- Equitable arrangements for development of the human resources engaged in the agribusiness sector.

Each of these elements and their application to the Indonesian agribusiness environment will be examined in greater detail in succeeding sections of this annex.

"Agribusiness" first came into general use as a concept among Indonesian agricultural professionals in the early 1990s. At that time a number of academics and government officials concerned with the agriculture sector, including Professor Bungaran Saragih, the present Minister of Agriculture, became convinced that economic growth was heavily dependent on rapid improvements in agriculture, including the related input and output industries.

In a sense, however, agribusiness (although not known by that term) has been a mainstay of the Indonesian economy for several centuries. The potential profit to be gained through agribusiness was one of the key features that originally persuaded the Dutch to colonize the Spice Islands, as Indonesia was then known. The lucrative trade that the Dutch colonizers initiated in copra, rubber, coffee, cocoa and other industrial crops continues to this day.

Agribusiness, including the sale of seeds, fertilizers and other production inputs to agricultural producers and the purchase, handling and marketing of their crops, has been an integral part of the Indonesian agricultural scene since the advent of commercial agriculture. Until relatively recently, however, government and donor assistance to the agricultural sector focused almost exclusively on production. There has been a growing realization of the importance of marketing to agricultural development during the past decade or so, but the concept of agribusiness systems is a relatively recent arrival.

The Importance of Policy

The proper implementation of appropriate policy measures represents the essential foundation for successful agribusiness systems development. This truism is amply illustrated by the widely divergent progress exhibited by the agriculture/agribusiness sectors in Thailand and the Philippines. The Thais, through the enactment and implementation of a policy regime favorable to the agriculture/agribusiness sector, have scored signal successes not only in supplying food to their own population, but also in accessing export markets for food and agricultural products. As a result, Thailand has a vibrant agribusiness sector that draws its raw materials from a relatively well-off, diversified agricultural production base consisting largely of smallholders.

In contrast to Thailand, successive Philippine governments have failed to adequately address the development needs of the agriculture sector. As a result, the country is forced to import a significant share of staple commodity consumption (rice, corn, sugar and vegetable oils) as well as peanuts, potatoes, vegetables, meat and live animals and many others. The

agribusiness sector in the Philippines consists primarily of large corporate conglomerates at one end of the scale and backyard operations at the other, with relatively few medium scale enterprises. Despite the productive potential for high value crops, agricultural commodity and value added exports are limited to pineapple, bananas and tuna (controlled by a handful of large corporations), copra, and seaweed (the latter returning low margins to the mostly poor, mostly Muslim seaweed growers in the southern islands).

Rural Infrastructure

The establishment and maintenance of effective agribusiness systems serving small-scale farmers requires the existence of adequate physical rural infrastructure. For example, being able to move agricultural commodities expeditiously to market while maintaining their quality is one essential prerequisite to the operation of effective agribusiness systems. There are numerous examples of the benefits brought about through building new roads and bridges in rural areas. Economic benefits include an immediate increase in trade, with resulting growth in local income; corollary benefits include easier access to essential social services such as education and health facilities. While the benefits brought about by the construction of new rural roads are commonly recognized, there has, unfortunately, been less emphasis placed on their continuing maintenance.

Typically, donor funding is available for initial construction, with the national or local governments expected to provide resources for maintenance. Budgetary constraints at both levels, however, often make adequate levels of ongoing maintenance impossible. Under these conditions, the benefits brought about by improved rural transportation links are transitory at best.

The availability of water is critical to agricultural productivity, particularly with high value horticultural crops (although these typically require less water per plant unit than do many of the staple crops). Irrigation systems in Indonesia, as in many other developing countries, have been poorly maintained. Poorly maintained systems greatly reduce the efficiency of water use. The Government of Indonesia is currently transferring the responsibility for operating, and maintaining, irrigation system to local farmer-led irrigation societies, with maintenance costs to come from user fees. This could be a favorable trend, but it is apparently too early to determine whether or not the scheme will work effectively.

Telecommunications facilities are essential to the transmission of marketing and technical information to farmers. Timely communications are an important tool for redressing the balance of power between traders and producers. While radio, telephones and facsimile machines can be important farmer communication tools, the advent of the internet has greatly enhanced the ability of small-scale farmers to access and act upon market and technical information.

Markets and Marketing

National and international markets typically require large volume deliveries. Small-scale farmers in order to meet these volume requirements need mechanisms that enable them to achieve product consolidation. The typical mechanism for product consolidation in developing country small scale agriculture is the trader. Relegating the consolidation of high value agricultural products to traders, however, presents a number of drawbacks for both the producer and the final user.

- The trader since he is primarily concerned with capturing an adequate margin between his buying and selling price is generally not sufficiently concerned with, and may lack

the capability of, adequately satisfying buyer specifications in terms of product quality and uniformity.

- The farmer is unable to capture the price premiums that might accrue to products that meet these buyer specifications.
- The producer and buyer lack the opportunity to develop an ongoing, mutually beneficial commercial relationship.

There are a number of requirements for gaining and maintaining market access on the part of small-scale farmers. Access to timely market information is essential to commercial farming operations. Small scale farmers in developing countries, however, typically sell their crop at farm gate to local agents. The crop then often passes through the hands of a multi-tiered system of intermediate agents before it reaches the final buyer. Timely information on prices and sales volumes at alternate markets can enable the farmer to exercise some control over his market returns, provided he is able to divert his crop to these markets. If this is not possible, however, and where one or a few buyers dominate local procurement, the farmer may have no recourse but to accept the price offered. Timely market information then becomes irrelevant unless the resulting disparity in marketing power is offset through access to adequate post harvest and marketing facilities, the operation of farmer organizations, and/or linkages to assured markets offering equitable prices.

Market intelligence is also important for longer range farmer planning. The gathering, analysis and effective utilization of market intelligence, however, is normally beyond the capabilities of individual small-scale farmers. This requires an intermediary that has these capabilities and also has some incentive for providing the small-scale farmers with useful market intelligence.

Accessing local markets (nearby villages and towns) directly, through auctions, or via traders is a relatively simple process for small-scale farmers. The goal, and the challenge, of Indonesian agribusiness development efforts will be the enablement of small-scale farmers to sell their horticultural and livestock products to buyers for national and international food processors, supermarket and fast food chains, up-scale hotels and restaurants and other premium outlets.

The primary requirement for penetrating national and international markets for high value agricultural commodities is the ability to supply products that meet buyer specifications for quality, appearance, volume, timing of delivery and price. The ability to meet these specifications is beyond the individual capabilities of most small-scale farmers. Doing so will require some form of farmer organization.

The establishment of cooperatives has constituted the traditional approach to organizing farmers. Cooperatives, however, for a variety of reasons, have not been particularly successful in most developing Asian countries. One of the most important reasons for this lack of success has been the approach to organizing cooperatives in these countries. In Europe and North America, cooperative development originally came about because of a felt need by farmers to redress the balance of market power between themselves and buyers of their produce (or, in some cases, suppliers of inputs).

In most of the developing countries of Asia, however, cooperatives have generally been organized at the behest of government, with government funding, rather than through farmer initiatives. This has led to numerous failures. This is not to say that cooperatives cannot be successfully organized among small-scale farmers in developing countries. There have been

some successes. It would appear at this point, however, that stressing the benefits of the most effective form of farmer association to facilitate market entry, whatever that form might be, would be preferable to specifying that these associations should be organized as cooperatives.

Effectively organizing small-scale farmers is a necessary but not sufficient prerequisite for successful market entry. Farmers must be trained to produce commodities suitable for the target markets. They must have access to the proper production inputs, to the funds necessary to purchase these inputs, and to appropriate post harvest and marketing facilities. There must also be mechanisms to provide access to the markets and to ensure equitable sharing of margins.

These market access mechanisms must be commercially viable arrangements. They cannot be government sponsored. The most viable mechanism will consist of formal links between marketing enterprises and grower organizations. Ideally, the firm will not only market the farmers' products, but will also provide the technical services and credit needed to enable the farmers to meet the above market entry requirements.

Credit

While there are a number of important constraints to small farmer development, availability and ready access to credit is often a principle determining factor. Small farmers who are forced to depend on informal lenders or traders for loans with exorbitant interest rates become perennial debtors with little or no ability to accumulate the capital required to improve their farming operations.

Technology

The ability to supply commodities that meet the specifications established by domestic as well as international buyers is dependent, among other factors, on the existence of adequate post harvest facilities. These include facilities for collection, cleaning, sorting, initial processing (in certain cases), storage and transportation to market as well as market structures. Such facilities are even more critical when marketing high value perishable commodities such as fruits, vegetables, meat and fish.

The most common marketing system shortcoming affecting high value perishable commodities is the lack of proper cold chains. The term "cold chain" does not refer only to refrigerated storage and transportation facilities. The cold chain starts in the field, with the use of proper harvesting techniques to protect product quality. It requires initial pre-cooling (normally not more than two hours following harvest) and the maintenance of uniform cool temperatures from the initial pre-cooling point to the final consumer outlet.

The traditional conduit for new technology for small-scale farmers as well as the assistance required to apply the new technology has been government-sponsored agricultural extension services. Most developing country extension services historically, however, have focused their attention on the "politically sensitive" staple food and primary industrial/commercial crops, with relatively little attention paid to high value crops, since these were mostly produced in small volume lots for local markets.

Government sponsored agricultural extension services have grown progressively less effective in promoting small-farmer progress over that past several decades. This has been largely due to national government budgetary constraints and accompanying widespread disinvestment in agriculture by both governments and donors. The effects of the diminishing financial support for extension have been exacerbated by the adoption of extension methodology that later proved inappropriate, such as the widely followed Training and Visit approach. Field

extension activities have been devolved from national to local governments in several developing countries, including Indonesia. This devolution in most cases has further debilitated extension organization and operations.

The traditional government-sponsored agricultural extension model through necessity is gradually being replaced with alternative mechanisms for transmittal of new technology to farmers, particularly those who produce high value commodities. This trend will accelerate as the full impact of globalization makes it increasingly critical for the agriculture sectors of developing countries to become internationally competitive.

There are several alternative approaches to providing technical extension services to farmers. These services can be supplied by commercial agribusiness firms as part of their system of supply and market linkages (see Annex 2, The Nucleus Enterprise Model); by suppliers of production inputs and buyers for agro-processors; through commodity and/or farmer associations; by commercially contracted extension services (following the example of Australia and several Latin American countries as well as a trial effort currently underway in Sri Lanka); and by various other means.

Organization and Cooperation

The development of a reliable and committed production base is an essential requirement for an agro-processor or large-scale trader dealing in high value commodities. Agro-processors and trading firms in order to stay in business must be able to obtain a reliable supply of commodities of the desired quality. A major portion of traded high value commodities in developing countries such as Indonesia are still procured through spot purchases, either directly from the producers or, more commonly, through a multi-tiered system of traders. Given the increasingly stringent sanitary and quality requirements (and, in the international market, fair trade restrictions) imposed by international and local buyers, particularly supermarkets, however, the trend is toward the establishment of more direct, formal links between buyers and producers.

For most if not all developing countries, social pressures, population increase and economic conditions militate against any expansion of plantation agriculture. This is particularly applicable in the case of high value crops (including horticultural crops, livestock and aquaculture). This implies that in most cases, a buyer who wishes to develop a viable production base must do so by linking with small-scale farmers. (It may be advisable for an agro-processor to have a company-owned nucleus production unit, but due to social and economic pressures, this unit will rarely be large enough to completely supply current needs or allow for expansion).

One of the critical strategies for achieving equitable agricultural development that fosters the national objectives of employment growth, increases in income, poverty reduction and enhancement of rural social conditions, as well as overall economic growth, is building the capacity of small-scale farmers and integrating large numbers of these farmers into commercial agribusiness systems. One means of doing this is to form direct, formal supply links between groups of farmers and processors or large-scale traders. The resulting production base can become a significant asset for the buyer/trader.

In order for small-scale farmers to become reliable commercial suppliers, several factors must be present. Farmers must have access to:

- A source of production credit at reasonable (commercial) rates as well as medium and longer term credit for capital investment in expansion and improvements;

- Suitable production inputs including improved planting materials;
- Appropriate technology and technical assistance to enable the farmer to effectively apply that technology;
- Timely market information;
- Post harvest, transportation and marketing facilities;
- A mechanism for consolidating output with that of other producers in order to meet market volume requirements;
- And, most important, access to profitable markets.

Annex 5. The Nucleus Enterprise Model

The Nucleus Enterprise Model

by Donald M. Taylor
International Specialist in Agribusiness
And Rural Enterprise Development

The following conceptualization of the Nucleus Enterprise Model (NEM) was developed by the author during a consulting assignment in Papua New Guinea for the Asian Development Bank (ADB). The goal of the ADB assignment was to design a smallholder agribusiness development project that would channel funds for project implementation to the private agribusiness sector, with government approval, rather than utilizing the standard ADB practice of depending on the government to control the disbursal of the funds and the implementation of the project activities. The NEM was subsequently adopted by the Government of Papua New Guinea as a priority approach to agribusiness development and forms the basis for an ADB-funded agribusiness development project that will be undertaken in the near future in PNG.

The NEM is not a new concept. Variations of the model have long been practiced by agribusiness enterprises in various countries. The following is an attempt to develop a rational framework to illustrate the operations of the model as an aid to applying the NEM as a tool for agribusiness development.

Interestingly, the Indonesia government has formalized and institutionalized a system that they call the "partnership" approach, which is similar to the NEM. A sizeable number of agribusiness companies are applying this model, with varying degrees of success. While the system needs some improvement, it provides a valuable base for further integration of small scale farmers into the Indonesian agribusiness system

Application of the NEM

One of the most productive approaches to smallholder agro-industries development is through the involvement of private sector nucleus enterprises. A nucleus enterprise is defined as a commercial agro-industrial entity that has access to markets, technology, and production inputs as well as possessing the management skills and the financial resources required to extend this access to associated smallholders. The nucleus enterprise is usually a commercial agro-processing entity but can be some other type of agro-industry entity that incorporates the above features. The chief motivation for the nucleus enterprise to formally associate with and to extend support services and production inputs to smallholders is normally the desire to obtain a larger and more reliable supply of higher quality raw materials and/or semi-finished products for its markets.

Although nucleus estates can qualify as nucleus enterprises, the nucleus enterprise concept is much broader than the traditional nucleus estate scheme. Nucleus estates are found primarily in the industrial tree crop sectors, rubber, palm oil, coffee, cocoa, etc. Nucleus enterprise systems by contrast can be applied to high value vegetable, fruit and other food crop production as well as to livestock and industrial crops. While the NEM is likely to utilize contract growing schemes as a mechanism to link the nucleus enterprise with smallholder suppliers, the NEM is much broader in scope than the typical contract growing scheme.

The nucleus enterprise system treats the out-growers as partners in the enterprise rather than as mere contract suppliers. The nucleus enterprise provides a guaranteed market outlet for

associated smallholders, as well as technical extension services and credit in the form of production inputs. In order for the NEM program to be successful, however, the nucleus enterprise must also exercise some degree of management control over the smallholders' production and post harvest practices and must take some responsibility for the general well being of the smallholder and his family. Properly designed and carried out, the nucleus enterprise system benefits both the agro-enterprise and the associated smallholders, enabling both segments to enjoy a greater degree of prosperity.

The NEM concept is already being applied to a greater or lesser extent by a number of agribusiness firms, NGOs and others operating in developing countries including Indonesia. This paper represents an attempt to present the NEM in a form that can be easily understood and readily applied by agricultural development practitioners and commercial agribusiness enterprises operating throughout the developing world.

A complete system must be in place in order for an agricultural operation to qualify as an NEM. The basic elements of this system include the extension of credit for production inputs on an in-kind basis; providing qualified technical production and post harvest extension services to the smallholder-suppliers; working with farmers to develop production and harvest schedules aimed at maintaining a steady supply of product that matches market demand, thus increasing the returns to both farmer and nucleus enterprise; transporting farmers' products from the field to the first processing point; processing the products to add value; and finally, maintaining access to profitable markets. The essential starting point for a successful NEM is ready access to markets.

An example of a typical NEM might be where an agro-processor maintains a company production base but needs additional raw material in order to utilize a higher degree of processing plant capacity and/or to satisfy available market demand. The processor might be able to purchase additional commodities from the open market, but in this case there is no assurance of a reliable supply, uniformity of product or level of quality. In order to avoid these uncertainties, the processor might instead arrange to contract with nearby smallholders who are already producing the desired commodity or are willing to initiate new production.

The processor would negotiate production contracts with the smallholders. The contracts would specify a farm gate price or, more commonly, a formula for determining the price at harvest time (based on local, national or world price, degree to which the commodity meets specifications and possibly other considerations). The buyer might be responsible for:

- ***Sourcing short-term credit for production inputs and making the credit available to the farmers on an in-kind basis (the farmer would receive the inputs rather than the cash);***

The nucleus enterprise would normally obtain the credit funds from a bank or other financial institution (some larger firms may be able to extend all or part of the credit using their own resources). Depending on the managerial and technical capability of the nucleus enterprise and the extent to which it has reliable access to markets, this can be the most secure form of small farmer credit, much more so than in the case of a financial institution extending credit in the form of cash directly to the farmers. The nucleus enterprise in this case acquires the commodity at time of harvest and deducts the amount of the credit from the sales proceeds paid to the farmer.

- ***Acquiring and distributing production inputs to the farmer;***

The basic inputs would consist of planting materials, fertilizer, pesticides and others as required. This arrangement can be advantageous to both the nucleus enterprise and the farmer. The enterprise ensures that the farmer applies the proper inputs required to meet product specifications. The farmer can afford inputs of higher quality and sufficient quantity without going into debt to a trader or money lender.

- ***Making medium and longer term credit depending on the nature of the farming operation;***

For example, the nucleus enterprise might provide longer term credit for structural materials for the broiler houses, feeders, water, etc. for a smallholder integrated broiler contractor; trellises for tomato production; breeding cattle for a live cattle buyback program; post harvest storage, etc. The repayment would be deducted from farmer proceeds over an agreed upon length of time instead of at the first harvest.

- ***Providing payments for household needs;***

One of the important constraints to achieving the expected results with contract growing arrangements is the need of the farmer for ready cash during the growing season, before the crops have matured and are ready to be sold. In many countries, the only recourse for the farmer is to borrow from an informal money lender, at an exorbitant rate of interest.

- ***Specifying a schedule for planting, fertilizing, cultivating and harvesting the crop;***

In order to ensure a reliable supply of raw materials that meet the needs of the nucleus enterprise and its clients, it is necessary for the enterprise to exercise a degree of control over the cultivation and harvest operations undertaken by the associated smallholders. Agreement by the smallholder to follow the instructions of the nucleus enterprise represent a quid pro quo for the market assurance and higher returns made available to the producer under this system. In some cases, an agro-processor functioning as a nucleus enterprise may return a share of its profits to the associated producers.

Examples of NEM Application

There are a number of examples of the NEM in practice. In Papua New Guinea, where the model was first conceptualized and applied by the author, the best existing examples of successful NEM linkages are provided by several of the large oil palm estate companies. These companies purchase palm fruit for processing from surrounding smallholders as well as producing it on their own estates. Several of the companies extend production credit in kind, and, jointly with the oil palm association, employ technical field people to assist the growers. At least one of the major companies supplies superior quality seedlings to its smallholder-suppliers. All of the companies add value to the oil palm fruit through processing it in modern mills and refineries. The companies have developed special programs for involving the entire community in their operational planning and procedures and to provide opportunities for grievances to be aired. They have also initiated measures for making increased opportunities available to women in the oil palm area.

In the Philippines, a major international agribusiness firm supplying processed pineapple products and fresh bananas as well as other specialty products to the world market has built a very successful asparagus production and export enterprise based on the nucleus enterprise model. The company has become the major supplier of fresh asparagus to the Japanese market, while the small-scale contract growers who produce the asparagus have become relatively wealthy during the little more than a decade since the business was started.

This nucleus enterprise company provides planting materials, production input credit, technical support, quality control, transportation, semi-processing and marketing of the product. They have taken a significant step beyond these basic services, however. In addition to extending credit for production inputs, the company during the production cycle provides the growers with a cash stipend on a regular basis, for meeting household needs during the period from planting to harvest. This enables the producers to avoid the perennial cycle of never-ending debt to money lenders, which is perhaps the single largest constraint to the economic betterment of small-scale farmers in the Philippines.

The NEM has been given an interesting twist in Upper Egypt, where an international NGO has organized several groups of small-scale farmers to produce and market high value agricultural commodities to Europe during the off-season. With no competitors in their particular market niche, the farmers are earning a high rate of return from their relatively small farm plots. The NGO provides the production credit and assists in quality control, while a large fertilizer distributor supplies much of the required technical assistance as a means of increasing the demand for his fertilizers.

These are only a few of the examples of the NEM in practice. One of the supposed drawbacks of the NEM is the fact that it requires greater expenditures and the application of a more intensive management system than is the case with a more limited contract growing arrangement. The additional returns in the form of a more regular supply of higher quality product can easily make this additional effort very worthwhile in financial terms, however.

NEM Benefits

The following table summarizes some of the benefits that can be realized from application of the NEM.

Figure 1: The Smallholder - Nucleus Enterprise Model

Extension

- The nucleus enterprise has the focused technical capability to provide productivity enhancing advisory services to smallholders.
- It is advantageous for the nucleus enterprise to provide such technical advisory services to affiliated smallholders because it increases the quality and volume of products marketed by the nucleus enterprise.
- The nucleus enterprise can also provide a valuable service by helping government and/or quasi-government research institutions prioritize their research efforts to focus on activities that directly address commercial productivity improvement.
- The technical extension services provided by the nucleus enterprise are continually upgraded; in order to remain competitive, the nucleus enterprise must ensure that their smallholder suppliers continue to improve their own production and post harvest techniques.
- The technical extension services provided by the nucleus enterprise are by definition sustainable as long as the enterprise continues in business; a continuing smallholder extension effort is required to maintain productivity and market access and is funded by increases in product volume and value.

Market Access

- The nucleus enterprise possesses the market access that smallholders often lack due to limited volume, inferior quality and other constraints.
- The most important criterion defining a nucleus enterprise is its access to profitable

markets; in order to remain viable, the nucleus enterprise must not only maintain its access to present markets, but must also continually seek out new and more profitable markets.

- The ability of the nucleus enterprise to maintain and extend market access depends on the capability of its smallholder suppliers to produce to constantly changing market specifications.
- In order to do this, the nucleus enterprise must continually work with its smallholder suppliers to upgrade their technical production and post harvest skills.
- The sustainability of market access by the nucleus enterprise is dependent not on government budgetary support or donor funded projects, but on the business capabilities of the enterprise.

Supply logistics

- The nucleus enterprise has the technical capability and access to information required to select
  production inputs based on the most rational productivity criteria.
- The nucleus enterprise because of its volume purchases can usually provide production inputs at a significantly lower cost than can individual smallholders.
- The nucleus enterprise must also have the financial capability or access to commercial financing required to provide production inputs on a reasonable credit basis to its smallholder suppliers.
- The nucleus enterprise either possesses the in-house logistical capability of delivering production inputs at the time, place and in the volumes required by their supplier smallholders or has the financial and management resources required to outsource these logistical services; most smallholders lack this capability.

Production Credit

- The nucleus enterprise has the optimum capacity to both provide production credit and to ensure that credit is repaid, through distributing the physical production inputs to the smallholder suppliers, marketing smallholder production and deducting loan repayments from product sales.

Smallholder Food Crop Marketing

- Building effective partnerships between nucleus estate operators and smallholder suppliers of industrial commodities such as tree crops can establish a useful base for incorporating the marketing of smallholder food crops, both staples and high value products such as vegetables and fruits, into the already established transportation and distribution networks of the nucleus enterprises. The margins provided by reduction of in-transit losses and improvements in product quality can both improve smallholder returns and provide additional profit to the nucleus enterprises.

Ancillary Business Development

- The nucleus enterprise can also act as a catalyst to develop ancillary business enterprises in the local community, through outsourcing services such as trucking, nursery operation, land preparation and others, including assisting local entrepreneurs source the required investment capital and business skills.

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PART III: ANNEX

OF

AGRICULTURAL SECTOR REVIEW, INDONESIA

Indonesia, July – August 2003

Prepared by:

John W. Mellor (Chief of Party)
Walter P. Falcon
Donald M. Taylor
Bustanul Arifin
E. Gumbira Said
Effendi Pasandaran
(agreview@telkom.net)

CARANA
CORPORATION

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EXECUTIVE SUMMARY

Indonesia clearly demonstrates that high agricultural growth rates are at the core of employment increase and poverty reduction. The impact of agricultural growth on employment works principally through heightened demand for the enormous, labor- intensive, rural non-farm sector, which depends primarily on rising farm incomes to bolster increased demand and growth.

Indonesia's previous period of rapid agricultural growth, employment growth, and poverty reduction centered successfully on rice. The correct combination of technological advancements in rice yield mixed with large, targeted rice production programs resulted in phenomenal growth rates.

Now, the basis for rapid agricultural growth must focus on high-value commodities of smallholder estate crops, horticulture, livestock, and fisheries. Growth in those sectors can propel overall agricultural growth rates to new highs, but the requirements are far more complex than for the rice sector.

Only a return to sustained, rapid growth in rural incomes can bring the employment growth and poverty reduction needed to address equity, security, education, and environmental needs that currently are such a challenge to the Indonesian polity. At the conclusion, this report proposes a set of recommendations in policy, technology, and agribusiness to actualize Indonesia's promise of accelerated growth in farm productivity and incomes.

A Brief History of Poverty in Indonesia

Indonesia, in the 1960s and earlier, was the classic case of massive, boundless rural poverty. Poverty levels were on the order of 70 percent of the rural population. A copious literature, epitomized by Clifford Geertz's classic paper on agricultural involution, explained why entrenched economic and social systems would never allow escape from such poverty.

In the late 1970s and the 1980s, new International Rice Research Institute (IRRI) rice varieties adapted by the Indonesian rice research system, and national commitment to rice production self-sufficiency (i.e. BIMAS program) brought an unprecedented growth rate to agricultural production. The BIMAS program equipped farmers with low cost knowledge, fertilizer and credit, while other programs ensured stable, incentive prices. The result was an extraordinary decline by 2/3 in the proportion of the population in poverty.

In the 1990s, the agricultural growth rate slowed and then came to a halt, despite large increases in agricultural prices, which were prompted by the massive currency devaluations. As a result, poverty levels increased substantially, decreased slightly, and then fluctuated around a steady level of poverty.

Why the Connection Between Agricultural Growth and Poverty Reduction?

The poor are the landless or near landless whose incomes come substantially from the rural non-farm sector. Not included in this category are people whose income derives mostly from farming

their own land and who are primarily employed in farming. They are not poor since they have income from relatively full employment as well as from the land they own.

The rural non-farm sector produces labor-intensive goods and services, which cannot be exported due to low quality and high transactions costs. Farmers and the multiplier from farmers' expenditures are the primary source of demand for these non-exportable goods and services. Growth of the rural non-farm sector depends on rising farm incomes to supply that demand. Dual advantages are reaped by accelerating agricultural growth—raising farm incomes and employing the poor. Thus, poverty reduction is driven by increased agricultural productivity and consequent demand-driven gainful employment for the poor.

There is a parallel between farmers' economic well-being and employment rates. In the booming 1980s, farmers prospered and rural employment soared. In the 1990s, farmers prospered less and rural poverty increased. During the 1997/1998 financial crises, farmers prospered from higher food prices and contributed to growth in employment. Despite the upsurge in rural employment, those in the bottom quintile of the income distribution were poorer and worse off. While farmers' prosperity was due to higher food prices, the poor who spend most of their income on food purchases were hurt severely by the higher food prices.

How Will Agricultural Production Grow in the Future?

In the future, the main driving force for increased agricultural productivity gains will come largely from high value commodities – smallholder estate crops, horticulture, livestock, and fisheries. Currently, they comprise about 54 percent of agricultural production, but will account for 80 percent of growth in output. Of course, rice is still important, representing about 26 percent of the value of agricultural production, but its importance is much smaller than a few decades ago. Even with high growth rates in yields, rice is unlikely to account for much more than 10 percent of incremental output. Rice continues to be important, but not dominant, as was the case in the 1980s. As the country prospers, expenditure on rice will grow very slowly and will eventually decline, as Indonesia does not have a comparative advantage in rice exports, as a means of taking up the slack in demand.

The new sources of growth bring new problems to solve. Macroeconomic policy and physical infrastructure are even more important than in the past. Research is just as important, but will be far more complex with difficult challenges of priority setting, private sector interactions, and realizing biotechnology potential. New types of agribusiness are vitally important and face a myriad of policy, institutional and investment needs. Failure in resolving these issues will result in little employment growth, undiminished poverty, greater rural/urban income disparities, rural unrest, and increased school dropout rates.

Why is Foreign Aid Particularly Important to Agricultural Growth?

The Government of Indonesia has a largely urban-based political system, as is typical in Asia, that under-emphasizes the critical needs of agriculture. Foreign aid was important in helping to shift emphasis to the rural sector in the previous period of rapid growth. It could do so once again. In addition, rapid agricultural growth is possible because of the potential to catch-up with front-

runners. Foreign technical assistance brings the knowledge of best practices that makes catch-up growth possible.

The United States, in particular, has a comparative advantage in agricultural technology, in policy, and in certain aspects of agribusiness, as well as a distinguished historical record of assisting rapid agricultural growth across Asia. The United States has a strong leadership role in the donor community on agricultural policy and policy analysis and needs to support that role with quality policy analysis.

The Critical Role of Agricultural Policy

Shifting to a new strategy of agricultural productivity and income growth requires a new approach and increased support to agricultural policy analysis and implementation. Given a changed thrust, a substantial input of transnational experience becomes particularly important. Because the strategy needs to change, the first requirement is a priority setting exercise. There is much to do and not all can be successfully done at once. Properly done, such an exercise is complex and time consuming, involving broad stakeholder participation, difficult priority setting efforts, and substantial input from the experience of other countries.

That priority setting exercise will assist in setting priorities for in depth policy analysis. An outcome will be the identification of several macro policy issues vital to high value commodities and exports, interactions with other sectors such as physical infrastructure and education (both now constraining to high value commodity production), and a range of issues specific to the agribusiness sector that is vital to high value commodity growth.

Effective policy analysis will require further institution building, particularly at the regional level, new efforts to build trade association capacities, and assistance in policy advocacy, particularly to the trade associations.

Foreign assistance can expand access to knowledgeable personnel to work on these issues, can forge links among researchers in regional and national institutions, can disseminate knowledge of international best practices and experiences, and can inform the foreign aid donor community as it interacts on key policy issues.

The Basis for Productivity Increase – Research and Technology Generation

Another important component for agricultural productivity growth and international competitiveness is research. Agricultural research is particularly critical because of the major opportunities for yield and quality increase; cost reduction from the new frontiers of biological research; and efficiency in land use and conservation technologies.

The Indonesian research system is grossly under-funded as compared to other countries. Dispersed fund allocation leaves competent researchers woefully short of the support they need for good research. The system is over-extended in terms of the range of problems tackled relative to the support capacity. The yields of commodities need to increase, and the gaps between yield potential and actual yields need to be closed in order to achieve the agricultural strategy.

Biotechnology offers huge efficiencies in research, and Indonesia should incorporate and utilize the latest in research techniques. The appropriate regulatory and advocacy systems must be developed to ensure rigorous compliance with appropriate rules. In the new agricultural growth context there are great deficiencies in the post harvest technologies of high-value commodities that need to be alleviated. Emphasis on increasing production efficiency and quality improvement for international markets and domestic supermarkets are imperative. Foreign assistance is crucial to moving ahead in biotechnology and capacity building in the post harvest technology for high value commodities.

Agribusiness Systems Development, Constraints, Opportunities and Strategies

The overarching constraint to further development and growth of Indonesian agribusiness is the lack of adequate investment in the agricultural sector. Necessary for achieving international competitiveness, improving Indonesia's agribusiness will require increases in the level of public and private sector spending, as well as prioritizing the activities to be covered by such expenditures.

Significant improvements in the agribusiness systems will produce the greatest impact on sales and production of horticultural, livestock, fisheries products, and smallholder estate crops; profitable market growth in horticultural commodities being the most immediate. Agricultural growth must be led by demand. The current surge of the supermarket sector is already creating rapid growth in production and improvements in quality, particularly for horticultural products.

Given the limitations on government and donor resources, using these resources to address systemic problems within agribusiness will be more productive than applying scarce resources to improving individual commodities or even commodity systems. Priorities will have to be set among a wide range of systemic problems, including policy, physical infrastructure investment, the role of local governments, and quality control and regulation issues.

In Conclusion:

A change in agricultural development strategy away from a dominating dependence on growth in rice and corn production to the high value commodities can bring a return to high agricultural growth rates. The benefits will be immense in employment growth and all the factors so related to employment growth, including security, stability, participation in education, and regional equity. However, rapid growth in high value commodities requires a new strategy, new priorities, new approaches to policy, new priorities in research, and a major effort to assist the new forms of agribusiness that are central to high value commodity growth.

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Annex I. Scope of Work: Task Order for Agricultural Sector Review

I. Purpose

The purpose of this Task Order is to:

1) Provide technical collaboration to the Indonesian agricultural community, including the private sector, the Government of Indonesia and its partners, in reviewing the state of Indonesia's agriculture in light of global best policies and practices and encouraging greater economic rationality/efficiency in the agricultural sector while striving to reduce poverty.
2) Assist USAID/Indonesia in defining its supporting role in the modernization and development of the agricultural sector and to identify options and specific collaborative activities in the agricultural sector for USAID/Indonesia and AID/W.

The focus will be on private sector involvement, structure of food crops and cash crops production and marketing, technological innovation, and key policies and institutions.

II. Background

1. GOI Agricultural Sector

Indonesia has experienced extraordinary upheavals in recent years, and the processes of political and economic transformation, including decentralization, are still ongoing. Indonesia is ethnically diverse, and the availability of food is uneven. A large portion of the population continues to rely solely on agriculture for its livelihood. The country's natural resources, climate, and local cultures vary widely among regions, as does the potential for competitive agricultural growth and poverty reduction.

Agricultural growth averaged 3.8% annually in the 1980s. However, between 1990 and 1995 the rate of agricultural growth slowed to 2.9% and it was negative during the onset of the economic crisis due also in part to the impact for successive occurrences of El Nino. In 1999 the rate of agricultural growth was 2.7%, in 2000 1.7%, and in 2001 is estimated at 2.7%. Labor productivity and the gap between the agriculture and non-agriculture sectors widened over that period, contributing to an underlying structural poverty problem in the country. The decline in average farm size, the low level of capital available to small farms, the high cost of inputs, and the lack of alternate employment are problems that complicate efforts to improve rural incomes.

Various (and at times conflicting and restrictive) policies, adopted by the GOI in the past, have constrained the a sustainable private-sector-led agricultural growth: a top-down, command oriented approach; an extremely high degree of bureaucratic fragmentation; inappropriate environmental policies; predominant concentration on the rice economy and other staples toward food sufficiency in each locality; monopolies and frequent non-market oriented decisions related to crop and

technology selection. This problem has been more severe during the recent economic crisis, as evidenced by the initial abrupt abolition of most tariff and subsidies for the agricultural sector.

Consistent with the new country medium-term development strategy, as outlined in the National Development Program (PROPENAS) for 2000-2004, there is an urgent need to accelerate the economic recovery of the agricultural sector and to strengthen the foundations for its sustained market-based growth by:

- Adopting and refining appropriate agricultural policies aimed at the sustainable use of Indonesia's wealthy natural resource base and at strengthening Indonesia's competitiveness within regional and international markets.
- Strengthening basic infrastructure and appropriate service institutions, both within the private sector and the Government structure, with the involvement of stakeholders.
- Enabling sustainable recovery and pro-poor growth by enabling and encouraging agribusiness development toward five main objectives: (1) improved yield, quality and output in food crops, horticulture, animal husbandry, fishery, plantation, and forestry; (2) improved job and business opportunities in rural areas; (3) increased value added; (4) increased private investments in agriculture and rural areas; (5) allocation of the most appropriate public investments, keeping in mind the present condition of the agriculture sector in Indonesia; and (6) preservation of natural resources and the environment.

2. USAID support

On a global basis USAID/W is committed to renew its leadership in the provision of agricultural development assistance [1], to be framed within the context of a new agricultural strategy in response to major emerging opportunities:

- Accelerating agriculture science-based solutions, especially using biotechnology, to reduce poverty and hunger;
- Developing domestic, regional and global trade opportunities for farmers and non-farm rural industries;
- Bridging the rural knowledge divide through training, outreach, and adaptive research at the local level; and
- Promoting sustainable agriculture and sound environmental management.

In its strategy for the agricultural sector dated August 14, 2001 [2], the ANE Bureau is encouraging its missions to re-evaluate ongoing programs and strategies to include agriculture activities within their portfolios, in collaboration with other U.S. government agencies – USDA, USTR, Commerce, and EPA. The following areas are proposed for consideration:

[1] USAID, 2001. Future directions for agriculture: USAID's Interim Agricultural Strategy.
[2] USAID, 2001. Agriculture, Food Security and Economic Growth: a New Strategy for the ANE Region.

- Policy: enabling policy environment promoting crop diversification, market integration, and responsible private sector involvement.
- Trade and Globalization: assist with meeting grades and standards requirements; conform to WTO regulations, regional trade enhancement, and bilateral trade agreements; assist in formulating government policy/interventions to increase the productivity and competitiveness of small farmers, while nurturing/safeguarding them from unfair competition.
- Information Technology and Biotechnology: further develop local capacity, form synergies with international research centers/donors, and establish links and scientific exchanges with U.S. private and educational institutes.
- Environment and Water: Promote conservation of forest, land, and water through partnerships between the public and the private sectors and the involvement of the local communities; and offer alternatives to unsustainable agriculture.
- Targeted Interventions: utilize host country competitive advantage with specific high-value crops to gain a greater local and international market share; and targeted activities focused on rain fed and marginalized areas.

In its feedback to the Mission's FY 2002 Annual Report Review, AID/W provided the following comments: "With the perspective of an upcoming new strategy and the agency's recognition of the important role of a dynamic and productive agriculture sector in sustainable development and economic growth, the Mission should conduct an agricultural assessment to examine what is happening in the agricultural sector. The assessment should identify positive opportunities where US leadership and technology transfer could be helpful in advancing and strengthening the competitiveness of the agricultural sector and its contribution towards economic growth and prosperity."

It is recognized by Mission management that an enhancement of activities in the agricultural sector could fit well within a revised Mission strategic approach that builds on existing relevant strategic objectives: sustainable economic growth, food aid, natural resources management, and decentralization. Accordingly, USAID/Indonesia is interested in facilitating a dialogue among private sector producers and entrepreneurs, civil society actors and GOI institutions in identifying specific interventions to be undertaken in a well-coordinated manner with a special focus on equity and poverty reduction.

Special consideration should be given to other donors' strategies and programs, and specifically a new strategy for agriculture and rural development being developed by the Asian Development Bank (ADB) and a new Support Program for Agriculture and Fisheries Development being prepared by the Japan International Cooperation Agency (JICA), to ensure coordination and a USAID targeted intervention and contribution in areas of comparative advantage.

III. Scope of Work

The assessment includes two major tasks:

1. A summary review of the state of the agricultural sector in Indonesia, including a review of its current status and potential, recent trends, strengths and weaknesses.
2. An identification of areas needing additional support, and specifically an identification of possible alternative interventions where U.S. leadership and technology transfer would be helpful in advancing and strengthening the competitiveness of the Indonesian agricultural sector and its contribution towards economic growth and prosperity.

Within the context of the agricultural sector, which, as broadly defined by the PROPENAS document, covers all aspects of food crops, horticulture, animal husbandry, fishery, plantation and forestry, the team is expected to focus on:

- private sector involvement (agribusiness, trade and investment, collaborative research),
- structure of food crops and cash crops production and marketing,
- technological innovation,
- and key policies and institutions.

While rice is not excluded because of its importance to Indonesian farmers and consumers, primary attention should be given to alternate crops.

Within these focus areas the team will identify and prioritize possible targeted interventions for USAID support based on the following criteria:

- likelihood of achieving demonstrable results within a five-year period;
- impact on increasing income of the rural families;
- impact on increasing employment opportunities of both rural and urban population;
- technological innovations where the US has recognized leadership;
- targeted high-value crops where Indonesia has a comparative advantage;
- strong Indonesian interest and collaborators;
- complementarity with other USAID/Indonesia programs.

The following a list of sample broad questions to be addressed in accomplishing the first task, i.e. summary review of the Indonesian agricultural sector:

- How did the agricultural sector evolve during the last thirty years? In which areas did the donors concentrate their support? What have been the major successes? What have been the major weaknesses? What have been the major constraints?
- What is the economic and social importance of agriculture in the country? What is the impact of recently adopted macro-economic policies on the agricultural sector? What is the current status of the agricultural sector?
- What are the key GOI institutions providing policy and guidance to the sector? What are the key elements of the GOI agricultural strategy? What is the current Government commitment to the sector as evidenced by investments and services? How effective are they in reaching the rural poor?

- What are the key problems encountered by the small farmers and rural entrepreneurs? What is the impact of the recently adopted policies, such as the reduction of subsidies, decentralization, and trade liberalization?
- What are the key elements of the structure of production, marketing and trade? What are the current asset distribution, land ownership and use? What do Indonesian farmers produce, sell and consume? What are the major constraints to increase farmers' profit, e.g., production inputs (seeds, fertilizers, pesticides), access to rural finance, commodity prices, etc.? What are the major imports? What can be expanded within the context of competitive domestic and foreign markets?
- How can a dynamic, competitive, free and independent, responsible private sector be strengthened? What are the major constraints? What specific actions should be taken? By whom? How can the GOI establish an enabling environment conducive to rapid results?
- What are the major challenges and opportunities of the ongoing agricultural transformation in the future? How can the issues related to land fragmentation and land transfers in and out of agriculture be effectively addressed? How can the processes of decentralization, local autonomy and regional integration be steered toward greater diversification, fair taxation, and efficiency? How can service delivery to the small farmers be improved through local and national channels, e.g. local and national technical offices, local and regional universities and research organizations, private sector firms and NGOs?
- Taking a look to the future, i.e. ten to twenty years from now, and based on demographic projections of future rural/urban balances, what would be the best options for an efficient Indonesian food system (production, importation, consumption)? What should be done now to reach the best options as envisioned?

The following is a list of sample questions to be addressed in accomplishing the second task, i.e. areas for possible US support:

- What has been the USAID experience with the agricultural sector in Indonesia? What lessons have been learned?
- What are the major ongoing and planned activities in the mission portfolio with a direct bearing on the agricultural sector?
- What areas within the Indonesian agricultural sector would respond more rapidly to assistance during the next five-year period?
- Based on the criteria identified and proposed by USAID, what are the key areas to be considered for future USAID intervention and support? How are they ranked and prioritized? What are the estimated costs for a five-year effort?

To accomplish its tasks as stated above the team will engage in various activities including:

- Review and analysis of available documents related to the status of the Indonesian agriculture sector, looking at the whole range of aspects, e.g., policy, research, technology, production, marketing, etc. in the light of best practices in other comparable countries and other parts of the world;

specifically, review the documents prepared by the World Bank and the Asia Development Bank (ADB) as well as the expected evaluation of the USAID/Indonesia Food Policy Activity and the initial work undertaken under the USAID/W Agricultural Biotechnology for Sustainable Productivity project.

- Conduct at least three focus group workshops outside the capital bringing together representatives from the private sector key stakeholders (e.g., cooperatives, associations, producer groups, agribusiness), universities and research institutions, NGOs and concerned GOI institutions.
- Conduct a workshop, to be organized in cooperation with BAPPENAS and the MOA, on the key findings from the desktop review and focus group workshops. The workshop would bring together leading experts in the field of agriculture from the private sector, concerned Government institutions and research organizations and universities.
- Prepare a draft report on the status and competitiveness of the Indonesian agricultural sector, including a brief presentation of its strengths and weaknesses, trends and prospects.
- Prepare a matrix on other donor support to the agricultural sector and identify areas for possible USAID support based on the criteria outlined above.
- Conduct a workshop, to be organized in cooperation with the USAID working group, to discuss and refine areas of possible USAID support. The workshop would bring together USAID personnel, contractors, grantees and others as identified by USAID to contribute to the possible areas of interest, capabilities and modalities to support the Indonesian agricultural sector.
- Draft and submit in final form two written reports: (1) major findings of the review of the Indonesian agricultural sector; and (2) alternative interventions/collaborative activities where U.S. leadership and technology transfer would be helpful in advancing and strengthening the competitiveness of the Indonesian agricultural sector and its contribution towards economic growth and prosperity, taking into consideration funding limitations.

IV. Team Composition

To review the present status of Indonesia's agricultural sector and to identify alternative and specific opportunities for USAID's assistance over a five-year period, the contractor is expected to provide the following technical experts:

- Two prominent expatriate agricultural sector consultants with complementary skills (for a period of six weeks each): one with a broad overview perspective on the agriculture sector as a whole, including both private and public sectors, and the other with a deep understanding of agricultural technology solutions to address the leading role of the agricultural sector in boosting incomes, rural employment and food security. The consultants should have advanced training (PhD/MBA/MA) and substantial expertise on various aspects of the agricultural sector as well as a good understanding of USAID and the Indonesian operating environment at this time of transition. One of the expatriate experts will act as team leader; he/she should have proven experience with agricultural sector

reviews and possess good organizational and team building skills; he/she will be responsible for coordinating and directing the overall effort, including the preparation and submission of the draft reports.

- Three Indonesian consultants (for a period of six weeks each) with complementary skills and deep knowledge and understanding of all major aspects of the Indonesian agricultural sector including: agricultural policy; research and extension systems; biotechnology; alternative crops; marketing and agribusiness; local and international trade. At least one of the Indonesian consultants should be a private sector agribusiness practitioner.

The proposed team composition reflects the importance of a strong participation by Indonesian experts to maximize the inputs based on local knowledge and data, and to ensure that the interventions proposed for USAID's consideration are not imposed from above but respond to documented needs as recognized by the Indonesian experts. On the other hand, the expertise of the expatriate consultants will assist in maintaining objectivity while bringing to bear the wealth of experience from the US and other countries.

The team will work under the guidance and technical direction of the Cognizant Technical Officer, defined herein as the USAID/ECG team leader or his designee, with support from the USAID/W Bureau for Economic Growth, Agriculture and Trade (EGAT) office. It is foreseen that the EGAT appointee would be on TDY in Indonesia for a period of two weeks during final stage of the consultancy, during the preparation of the draft report and the formulation and discussion of alternative interventions for USAID support. The team will meet once a week with the USAID/ECG throughout the period of its fieldwork to review progress.

In order to ensure appropriate coordination and support among the various Mission offices meetings will be held with interested parties. The Deputy Mission Director or his designee will chair the meetings. The group will be composed of members of interested offices, such as ECG (Economic Growth), NRM (Natural Resources Management), FFP (Food for Peace), USDA (U.S. Department of Agriculture) Field Services, DG (Democracy and Governance), DLG (Decentralized Local Government), HPN (Health and Nutrition) and PRO (Program Office).

V. Period of Performance

Six weeks starting o/a June 26, 2003. Each team member is expected to work full time for a period of six weeks (36 work-days each). The expatriate consultants are authorized up to three days for preparation and meetings with USAID/W and IQC Home Office, and four days for international travel. The Indonesian consultants are authorized up to five days of preparatory work to collect and begin the analysis of the available relevant data. The contractor is authorized a six-day workweek without premium pay.

VI. Logistics

All logistical support will be provided by the IQC contractor, including travel, transportation, secretarial and office support, interpretation, communication and report printing as appropriate. The ECG will assist in identifying private sector interlocutors for participation in the focus groups.

VII. Deliverables

The team will be expected to:

1. Upon arrival, the team will meet with USAID and present the proposed plan and methodology for the agricultural sector review, based on a thorough analysis of the SOW, the ANE and EGAT working papers and documentation, and drawing on the experience of similar assessment undertaken in other countries.
2. Brief USAID on a regular basis once a week and prior to departure, as appropriate, to present the team's major findings, conclusions and options for follow-up action. Provide draft Executive Summaries, including key findings, conclusions and options for follow-up action and draft of the reports at the pre-departure briefing.
3. Provide two separate final written reports to USAID/Jakarta within ten working days after receipt of USAID's comments and inputs: (a) report on findings of the Indonesian agricultural sector review, for general distribution, and (b) report on options for future interventions/collaborative activities for USAID and AID/W use. The contractor will submit to the USAID CTO: Mohamad Rum Ali, via email **mohamadali@usaid.gov** an electronic copy in Microsoft Word format and ten hard copies. The report will include all specified requirements of the SOW.

Format and Content:

The final reports must include an executive summary (three pages); table of contents; main text; and annexes including scope of work, methodology adopted, lists of individuals and organizations consulted, and bibliography of documents reviewed.

Annex II. Individuals and Organizations Consulted

Affiliation:	U.S. Agency for International Development	
	Name:	***Position***
1	M. Rum Ali	Economic Specialist
2	J. Chapman	Consultant
3	Ralph Cummings	Washington DC
4	Bruno Cornelio	Partnership for Economic Growth
5	Paul R Deuster	Economic Growth Team Leader
6	Quan X Dinh	Senior Economic Advisor
7	Bill Frej	Mission Director
8	L. Kent	Consultant
9	Anne Patterson	Rural Environmental Management Office Director
10	H. Quemada	Consultant

Affiliation:	DAI Food Policy Support – USAID	
	Name:	***Position***
1	Asep Saiful Bahri	Agricultural Economist
2	James Gingerich	Team Leader
3	Jack Molyneux	Agricultural Economist
4	Peter Rosner	Agricultural Economist
5	Peter Timmer	Chief Economist, DAI Washington DC

Affiliation:	Ministry of Agriculture Republic of Indonesia	
	Name:	***Position***
1	Erwidodo	Trade Expert
2	Suharyo Husen	Director for Business Development
3	Kaman Nainggolan	IAARD
4	Rahmat Pambudy	Adviser to the minister
5	Bungaran Saragih	Minister
6	Pantjar Simatupang	Director CASER, Bogor
7	Sumarno	Director General of Horticulture Production

Affiliation:	Ministry of Marine Affairs and Fisheries Republic of Indonesia	
	Name:	***Position***
1	Rokhmin Dahuri	Minister
2	Gellwynn Jusuf	Adviser for Economic, Social and Cultural Affairs
3	Widi Agoes Pratikto	Director General
4	Andin H. Taryoto	Secretary General

Affiliation:	National Development Planning Agency (Bappenas)	
Audience:		***Position***
1	Endah Murniningtyas	Director of Agriculture and Food
2	Dedi Masykur Riyadi	Deputy Regional Economics & Natural Resources

Affiliation:	World Bank	
Name:		***Position***
1	Jehan Arulpragasham	Senior Economist
2	Bert Hoffman	Chief Economist
3	Stephen Minks	Washington DC
4	Rahul Ratury	Sector Manager Rural Development
5	Andrew Steer	Country Director

Affiliation:	ADB Project	
Name:		***Position***
1	Malcom Bosworth	Trade Specialist
2	Geronimo M. Callado	Private Sector Development Specialist
3	Faizal Kosrynu	Deputy Team Leader
4	Mark Rosegrant	Team Leader

Affiliation:	Academics	
Audience:		***Position***
1	Arif Daryanto	Department of Agricultural Economics, IPB
2	Dedi Budiman Hakim	Department of Agricultural Economics, IPB
3	Rina Oktaviani	Department of Agricultural Economics, IPB
4	Yusman Saukat	Department of Agricultural Economics, IPB

Affiliation:	Others	
Audience:		***Position***
1	Saleh Affif	Former Coordinating Minister of Economics &Development
2	Tatang hadinata	Director PT. Saung Nirwan
3	Richard Patten	Finance Expert, Former BRI Consultant
4	F. Rahardi	Director Agribusiness Working Forum

Annex III. Focus GroupLocation and List of Participants

Venue : SAHID HOTEL MAKASAR
Date : July 29, 2003

No.	Name	Position
1	Prof. DR. Ir. H.M. Syawal	Dean of Agriculture Faculty, Hasanuddin University
2	Robert Rosengren	Team Leader Success alliance
3	Rebecca Branford-Bowd	Cocoa Farming System Analyst
4	Rene Terneusen	PT EFFEM Indonesia
5	Ir. Juremi Gani,M.Agr.	Dean of Agriculture, Mulawarman University
6	Prof.DR. Dan T. Sembel	Senior Lecturer, Agriculture Faculty, Sam Ratulangi Univ
7	Ir. O. Kambuaya, M.Si.	Dean of Agriculture Faculty, University of Papua
8	Saban Echdar	PARUL South of Sulawesi
9	Natan Kamsuno	Provincial Trade and Industri Service, Makasar
10	Arni Mahmud	Provincial Marine and Fishery Service, Makasar
11	Laaodi Mandong	ASKINDO
12	Taswin H.P.	Head of AEKI Makasar
13	Sabirin M Badri	Head of Ministry of Trade and Industry, Makasar
14	N. Ikandjaja	Head of Bank Indonesia, Makasar
15	Dr. Ruslan	Head of Bappeda, Makasar
16	M. Karya Yunus	Vice Head of Provincial Estate Group Service, Makasar
17	A. M. Yamin	Head of BPPMD
18	H. Abdullah Naser	Dean of Agriculture Faculty, Univ. of Tadulako
19	Dr. Subandi	BPPT Makasar
20	Dr. Djafar Baco	BPPT Makasar
21	Thamsil Thahir	Fajar Daily
22	H. Husna	Dean of Agriculture Faculty, Haluoleo University
23	Sjamsul Kwary	AEKI Sul-sel
24	Parman P	Lecturer, Agriculture Faculty, Univ. of Tadulako
25	Tedy	PT. JAPFA
26	Bruce Wise	Agribusiness Consultant-AusAid

Curriculum Vitae

Curriculum Vitae

Name : **Bustanul Arifin**
Nationality : **Indonesia**
Languages : **Bahasa Indonesia, English**

Key Qualification

Bustanul Arifin is associate professor in the Department of Agricultural Economics and Social Sciences at the University of Lampung, Indonesia. He just returned from his sabbatical leave under Fulbright Senior Research Fellowship at the Department of Agricultural and Applied Economics at the University of Wisconsin-Madison (USA). He holds an undergraduate degree (*sarjana*) from the Department of Agricultural Economics and Social Sciences at Bogor Agricultural University (IPB), Indonesia. His masters and Ph.D. degree were obtained from the Institute for Environmental Studies at the University of Wisconsin-Madison (USA) in 1991 and 1995, respectively. Dr. Arifin has published several articles on agricultural and resource economics, political economy and economic development. In additions, he has written more than a hundred popular articles in the national media. He is the Editor-in-Chief of the *Quarterly Review of the Indonesian Economy* or in Bahasa Indonesia *Bisnis & Ekonomi Politik* (BEP), a scientific journal devoted to the study of political economy and business issues and economic decision-making process in Indonesia. He has also served as Director of the Institute for Development of Economics and Finance (INDEF), an independent research institution aimed at providing assessments on a wide-range of public policy issues related to economics and finance. He was an economic adviser to the House of Representative (DPR-RI) in Indonesia for the commissions of agriculture, industry, and trade; and senior policy analyst at Poverty Alleviation through Rural-Urban Linkages of the United Nations Development Programme (UNDP), and the National Development Planning Agency (BAPPENAS) in Jakarta, Indonesia. He has been a consultant to the Japan Bank for International Cooperation (JBIC), The World Bank, International Labor Organization (ILO), the United States Agency for International Development (USAID), the German Agency for International Development (GTZ), The Ford Foundation, Worldwide Fund for Nature (WWF), and some local organizations in Indonesia.

Education

Ph.D. Resource Economics, University of Wisconsin-Madison, USA, 1995

M.S Resource Economics, University of Wisconsin-Madison, USA, 1991

Sarjana Agricultural Economics, Bogor Agricultural University (*Institut Pertanian Bogor*), Indonesia, 1985

Selected Professional Experience

2002 - 2003 **Fulbright Fellow, Visiting Professor**, Department of Agricultural and Applied Economics, University of Wisconsin-Madison, USA..

2000 - 2002 **Director**, Institute for Development of Economics and Finance (INDEF), Jakarta, Indonesia

2000 - 2001 **Chief Economist**, Agriculture-Forestry Development Program – Japan Bank for International Cooperation (JBIC) – Ministry of Agriculture, Indonesia.

1998 - 2000 **Senior Policy Analyst**, Poverty Alleviation through Rural-Urban Linkages Project of the United Nations Development Programme (UNDP) - BAPPENAS, Indonesia.

1997 - 1999 **Economic Adviser** to the House of Representative (DPR-RI) for the Commissions of Agriculture, Industry and Trade; Economics, Finance, and Development Planning, Jakarta.

1997 - 1998 **Institutional Economist,** Land Administration Project Part-C, the World Bank and National Development Planning Agency (BAPPENAS), Jakarta

1998 - 1998 **Economist**, Economic Law Implementation and Procurement Systems (ELIPS), the United States Agency for International Development (USAID) - Ministry of Finance, Jakarta.

1998 - 1998 **Resource Economist,** Economic Assessment on the Impact of Haze and Forest Fire in Southeast Asia of the Economy and Environment Program for Southeast Asia (EEPSEA) and Worldwide Fund for Nature (WWF) - Indonesia Programme, Jakarta.

1996 - 1997 **Economist,** Mission on Economic Promotion of the Small and Medium-Scale Enterprises of the German Technical Cooperation (GTZ) - BAPPENAS, Jakarta.

Selected Publications

Books

Arifin, Bustanul. 2001. Pertanian Era Transisi (*Agriculture in Transition*). Bandar Lampung: Universitas Lampung Press. 188 pages.

Arifin, Bustanul (co-author with Achmad Munir, Enny Sri Hartati, and Didik J. Rachbini). 2001. *Food Security and Markets in Indonesia: State-Private Interaction in Rice Trade*. Kuala Lumpur: Southeast Asia Council for Food Security and Fair Trade. 112 pages.

Arifin, Bustanul and Didik J. Rachbini. 2001. Ekonomi Politik dan Kebijakan Publik (*Political Economy and Public Policy*). Jakarta: PT Grasindo.

Arifin, Bustanul. 2001. Spektrum Kebijakan Pertanian Indonesia: Telaah Struktur, Kasus dan Alternatif Strategi (*Policy Spectrum of Indonesian Agriculture: Studies on Structure, Cases and Alternative Strategy*). Jakarta: PT Erlangga. 185 pages.

Arifin, Bustanul. 2001. Analisis Anggaran Negara: Prioritas, Realisasi, dan Strategi menuju Transparansi (*State Budget Analysis: Priority, Realization, and Strategy towards Transparency*). Jakarta: FITRA Press. 52 pages.

Arifin, Bustanul. 2001. Pengelolaan Sumberdaya Alam Indonesia: Pendekatan Ekonomi, Etika, dan Praksis Kebijakan. (*Natural Resources Management in Indonesia: Approach on Economics, Ethics and Policy Praxis*). Jakarta: PT Erlangga. 161 pages.

Arifin, Bustanul. 2000. Pembangunan Pertanian: Paradigma, Kinerja, Opsi Kebijakan (*Agricultural Development: Paradigm, Performance, and Policy Options*). Jakarta: Pustaka INDEF.

Arifin, Bustanul and H.S. Dillon. 2000. *Asian Agriculture Facing the 21st Century*. Jakarta: ASAE.

Arifin, Bustanul. 1999. Strategi Kebijakan Pembangunan Pertanian. (*Policy Strategies for Agricultural Development*). Jakarta: Pustaka INDEF.

Arifin, Bustanul (co-author with M. Nawir Messi, Puji Wahono, Didik J. Rachbini, Achmad Munir and Rahadi). 1998. Korupsi di Indonesia (*Corruption in Indonesia*). Jakarta: Pustaka INDEF.

Arifin, Bustanul (co-author with Chrisman Silitonga, M. Husein Sawit and Muhajir Utomo. 1997. "Pemberdayaan Lahan Kering untuk Penyediaan Pangan Abad 21" (*Upland Utilization for Food Security in the 21st Century*). Jakarta: Perhimpunan Ekonomi Pertanian Indonesia (PERHEPI).

Arifin, Bustanul (co-author with Faisal H. Basri, Didik J. Rachbini, M. Nawir Messi, Puji Wahono, Achmad Munir and Moeroe Supranoto). 1997. Kontroversi Kebijakan dan Ilusi Efisiensi (*Policy Controversy and Efficiency Illusion*). Jakarta: Pustaka Sinar Harapan.

Journal and Book Chapter

Arifin, Bustanul. 2001. Derajat Intensifikasi Penggunaan Lahan di Tingkat Petani (*Degree of Land-Use Intensification at Farm Level*). Jurnal Sosio-Ekonomika, Vol 7 (2), Desember 2001, pp: 12-16.

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Arifin, Bustanul. 2000. Pembangunan Agribisnis sebagai Basis Ekonomi Indonesia: Suatu Telaah Ekonomi Politik (*Agribusiness Development as a Basis for the Indonesian Economy: A Study of Political Economy*). Jurnal Agrimedia, Vol 6 (2), September 2000, pp: 4-9.

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Arifin, Bustanul, Agus Hudoyo and Agus Imron. 1997. "Pengembangan Potensi Pasar Buah-Buahan Indonesia: Analisis dari Sisi Konsumsi" (*Development of Export Potentials of Indonesian Fruits:A Demand-Side Analysis*). *Jurnal Sosio-Ekonomika*, Vol. 4(2), December 1997, pp: 16-22.

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Arifin, Bustanul. 1993. "Application of Optimization Methods: The Case of Local Transmigration", *Economics and Finance in Indonesia*, Vol. 41(1), March 1993, pp: 23-34.

Arifin, Bustanul. 1992. "Resource Use and Sustainable Development: The Case of Indonesian Agriculture", *Environment and Development*, Vol. 12(4) December 1992, pp: 193-209

Arifin, Bustanul. 1992. "Institutional Perspective on Natural Resource Issues: Lesson from Public Irrigation System", *Economics and Finance in Indonesia*, Vol. 40 (2), June 1992, pp: 135-155.

Arifin, Bustanul. 1992. "Land Utilization and Agricultural Development", *Economics and Finance in Indonesia,* Vol. 40 (1), March 1992, pp: 49-68.

Arifin, Bustanul. 1991. "Technological Change of Indonesia's Economic Growth", *Economics and Finance in Indonesia,* Vol. 39 (1) March 1991, pp: 51-67.

Papers for International Events

Arifin, Bustanul. 2003. "Declining Share of Agriculture in Indonesian Development". Paper presented at Development Workshop at the Department of Agricultural and Applied Economics, University of Wisconsin-Madison, March 20, 2003, in Madison, USA.

Arifin Bustanul. 2003. "The Rise and Fall of Indonesian Agriculture". Paper presented at the Center for Southeast Asian Studies, University of Wisconsin-Madison, February 21, 2003, in Madison, USA

Arifin, Bustanul. 2003. "The Economics of Shifting Cultivation of Forested Land in Sumatra, Indonesia" Paper presented on Seminar Series at Cornell International Development Program, January 31, 2003 in Ithaca, New York, USA.

Arifin, Bustanul. 2003. "Policy Analysis Matrix of Different Land-Use Practices in Lampung, Indonesia" Paper presented on International Workshop on Smallholder Agroforestry Options for Degraded Soils, April 27-30, 2003 at Subic Bay, The Philippines.

Arifin, Bustanul. 2002. "Stakeholder Participation in Water Management: Lessons Learned from a Traditional Water-User Organization in Indonesia". Paper presented at Stockholm International Water Symposium (SIWI), August 11-17, 2002, at Stockholm, Sweden.

Arifin, Bustanul. 2002. "On the Domestic Management of Price Risk in the Context of Trade Reform in LDCs". Discussion Paper for the Conference of the International Agricultural Trade Research Consortium (IATRC) on "The Developing Countries, Agricultural Trade, and WTO", June 16-17, Whistler, British Columbia, Canada.

Arifin, Bustanul. 2002. "*Reformasi* Works in Progress: An Institutional Economic Approach". Paper Presented at Seminar Series at Indonesian Embassy in Canada, June 15, 2003. Ottawa, Canada.

Arifin, Bustanul. 2000. "Farm-Level Economics of Land Degradation: The Case of Intensive Land-Use Practices in Lampung Province, Indonesia". International Society for Ecological Economics (ISEE) Conference, on July 5-9, 2000 at the Australian National University, Canberra, Australia.

Arifin, Bustanul. 2000. "The Role of Agriculture in the New Asia-Pacific Order: Seeking Strategies to Improve Farmers' Bargaining Position for the New Millenium". Seminar of the Asia-Pacific Regional Meeting of the International Association of Agricultural Students (IAAS), March 27, 2000, in Bogor.

Arifin, Bustanul. 1999. "Food Security and Markets in Indonesia: State-Private Sector Interaction in Rice Trade". Conference of the Southeast Asia Council for Food Security and Fair Trade, on October 24-25, Kuala Lumpur, Malaysia.

Arifin, Bustanul. 1998. "The Economics of Shifting Cultivation in Forest Land: Farm-Level Evidence from Sumatra, Indonesia" in the 1998 World Congress of Environmental and Resource Economists, on June 25-27 of 1998, in Venice, Italy.

Arifin, Bustanul. 1998. "Does Shifting Cultivation Really Cause Deforestation: The Case of Communal Forest Land in Sumatra" in the 7th Conference of International Association of the Study of Common Property on June 9-14 of 1998 in Vancouver, Canada.

Arifin, Bustanul. 1997. "Causes of Land Degradation in Indonesia: An Extreme Bound Analysis", in Mini-Symposium on Food Security, Diversification and Resource Management of the XXIII International Conference of Agricultural Economists, on August 10-16, 1997, in Sacramento, California (USA)

Arifin, Bustanul. 1997. "Social-Economic Aspects of Environmental Impact Assessments for Mamberamo Watershed Development: A Conceptional Thought for Discussion". Paper prepared for Seminar and Workshop

on "The Development of Mamberamo Watershed as a Growth Center in Eastern Indonesia" in Jakarta, April 7-8, 1997.

Arifin, Bustanul. 1996. "Economic Analysis of Land Degradation in Indonesian Upland" in the Second Asian Society of Agricultural Economists Conference, on August 5-9, in Denpasar, Bali, Indonesia.

Arifin, Bustanul. 1996. "The Economic Effect of Technology on Agricultural Society" in the International Seminar on "Tropical Agriculture in the Global Market" on July 23-24, 1996 at Bogor Agricultural University (IPB), Bogor. The seminar is a part of program series of The 39th World Congress on the International Association of Agricultural Students (IAAS), on July 15 - August 4, 1996, in Indonesia.

Arifin, Bustanul. 1996. "Misconception about Environmental Degradation: Lesson from Deforestation in Indonesia", in The Sixth International Symposium on Society and Resource Management, on May 18-23, 1996, at The Pennsylvania State University, University Park, Pennsylvania, USA.

Arifin, Bustanul. 1995. "The Economics of Land Degradation: A Case Study of Indonesian Upland", in Summer Seminar, on May 29, 1995, at Chr. Michelsen Institute, Bergen, Norway.

Arifin, Bustanul. 1995. "Indigenous Knowledge and Sustainable Commons: A Case Study of an Indonesian Subak" in The Fifth International Conference on Common Property, on May 24-28, 1995, in Bodo, Norway.

Arifin, Bustanul. 1994. "Misconception about Environmental Degradation" in The Eighth International Conference on Resource Stewardship for Environmental Sustainability, on June 12-18, 1994, at the John Hopkins University, Baltimore, Maryland, USA.

Arifin, Bustanul, E.G. Togu Manurung, and Emmy Hafild. 1993. "Economic and Environmental Consequences of Forestry Policies" in One-Day Seminar on Indonesia, on September 25, 1993, at the University of Wisconsin-Madison, USA.

Arifin, Bustanul. 1993. "Towards Free-Interest Islamic Banking System in ASEAN" in the Southeast Asian Muslim Delegates Conference, on September 17-19, 1993, in Cleveland, Ohio, USA,

Arifin, Bustanul. 1993. "A Closer Look at Deforestation in Indonesia" in The Fourth Global Warming International Conference, on April 5-8 1993, in Chicago, USA.

Association and Society Membership

. International Association of Agricultural Economics (IAAE)
. International Society for Ecological Economics (ISEE)
. International Association for the Study of Common Property (IASCP)
. International Association for Society and Resource Management (IASRM)
. Association of Environmental and Resource Economists (AERE)
. Asian Society of Agricultural Economics (ASAE)
. American Agricultural Economics Association (AAEA - USA)
. American Economic Association (AEA - USA)
. Perhimpunan Ekonomi Pertanian Indonesia (PERHEPI - Indonesia)

Countries Visited

Australia, Canada, England, Hong Kong, India, Italy, Japan, Kenya, Malaysia, Norway, Netherlands, Philippines, Saudi Arabia, Singapore, Sweden, Thailand, United Arab Emirates, United States of America.

Curriculum Vitae

Name : **E. Gumbira Said**
Nationality : **Indonesia**
Languages : **Bahasa Indonesia, English**

Education

Ph.D Chemical Engineering, The University of Queensland, Australia, 1992
MADev. Ghent State University, Belgium, 1993
Insinyur Post Harvest Technology from Bogor Agricultural University – Indonesia, 1978

International Experiences

Guest Professor at the University of Goettingen, Germany (1997).

Liaison Delegate of Indonesian Forestry Community to Word Business Council for Sustainable Development (Geneva) and attending meetings or debates in Geneva, Prague, London, Brussels, and Seattle.

Coordinator of Indonesian Forestry Community for Special Meeting with the World Bank (1998), on Sustainable Forest Management in Washington, DC and Jakarta.

Executive Director of the Indonesian Business Council for Sustainable Development (1997 - 1998)

Expert during the International Meeting on Sustainable Consumption Patterns in East Asia, Cheju Island, South Korea, 27-29 January 1999.

Expert on the Workshop on Post Harvest Technology (Join Committee of FAO and SEARCA), November 2001, Los Banos, The Phillippines.

Expert on the International Sago Starch Workshop, FAO, April 1998, Bangkok, Thailand.

Resource Person at the First Asia Pacific Round Table Discussion on Cleaner Production (March 1997 in Hua Hin, and November 1997 in Bangkok, Thailand).

Paper presenter at the International Agribusiness Conference in University of Chiang Mai, Thailand, 09-12 November 2000

Paper presenter at the Intenational Meeting on Cleaner Production and Sustainable Development, 14-17 December 1999, Taipei, Taiwan

Chairman of International Agribusiness Study Tours to ASEAN (1994, 1996, 2000, 2001); PR China and Taiwan (1995 and 2002) (MMA-IPB).

Chairman of Study Tour of PT. ISM - Bogasari Group to Asia Food, Hotel and Restourant EXPO, April 2002, Singapore.

Chairman of Study Tour Group of MMA-IPB and PT. ISM - Bogasari to Australia, December 11-23, 2002.

Paper presenter at the Fourth Asia Pacific Round Table Discussion on Cleaner Production, January 20-22, 2003, Chiang Mai, Thailand.

Paper presenter at the International Seminar on the Transformation of Management Education in Asia Pacific, June, 28th, 2003, Gadjah Mada University, Yogyakarta, Indonesia.

Presenting Papers or Conducting Scientific Visits in Australia, Germany, Canada, France, People Republic of China, Taiwan, Hongkong, Malaysia, Singapore, The Philippines, Belgium, Thailand, USA, UK, Netherlands, Luxembourg, Switzerland, Saudi Arabia, The United Republic of Emirates, and South Korea.

Experiences on Consultations

Consultant to PT. Galih Karsa Utama (on Agroindustry and Environment); (1984 - 1988).

Consultant to PT. Envietindo Bina Perkasa (Agroindustry and Environment) (1993 - 1994)

Consultant to APKINDO (Association of Wood Panel Companies) (1997 - 1998) for Sustainable Development.

Consultant to MMC - Estate Crops (2002 - 2001) (Estate Crops Development in Cooperation with Japanese Aids/JICA)

Commissioner to PT. Prima Kelola Agribisnis Agroindustri, IPB (2000 - now)

Review Partner to PT. ISM - Bogasari Flour Mills, PT. Charoen Pokphand Indonesia, PT. Gati Nusantara, PT. Saung Mirwan, PT. United Waru Biscuit Manufacturing, etc.

Publications

22 books in the fields of Agroindustry, Agribusiness Management, Biotechnology and Environmental Sciences.

More than 62 international papers in Journals, Proceedings and Presentations.

About 275 national papers in Journals, Proceedings and News Paper or Magazines.

Name: **Walter Phillip Falcon**
Profession: Agricultural Economist
Languages: **Bahasa Indonesia, English**

Key Qualifications

Mr. Falcon has forty years of experience in Agricultural Economics, Statistics, Economic Development, Economic History, and International Economics, combining significant contributions to academic literature with a wide range of experience in policy development and implementation. As a member of numerous International Advisory Committees he has been involved in macroeconomic decision-making at the highest level, in addition to producing cutting edge literature on southeast Asian macroeconomics, and has been instrumental in guiding economic and agricultural policy in southern and southeastern Asia for decades. In addition, his close relationship with the various centers of the CGIAR, in particular the IRRI and CIMMYT, has provided the ideal applied outlet for his substantial academic accomplishments. Mr. Falcon speaks fluent English and Bahasa Indonesia.

Education

Ph.D., Economics, Harvard University, 1962
M.A. Economics, Harvard University 1960
B.S., Agricultural Economics Iowa State University (Ames), 1958

Professional Experience

2001-Present	Helen F. Farnsworth Professor of International Agricultural Policy, Emeritus, Stanford University
2000-Present	Member, Board of Trustees, Center for International Forestry Research
1998-Present	Co-Director, Center for Environmental Science and Policy, Stanford University
1990-1998	Member, International Advisory Committee, Management Institute, (IPMI), Jakarta
1995-2001	Member, Board for International Agricultural Development, (White House/Agency for International Development)
1994-2001	Chair, Board of Trustees, International Maize and Wheat Improvement Center (CIMMYT)
1992-1998	Member, International Advisory Committee, North-South University, Dhaka
1991-1998	Director, Institute for International Studies, Stanford University
1989-1994	Chair, Board of Trustees, International Rice Research Institute
1984-1994	Member, Board of Trustees, Winrock International
1988-1991	Cognizant Dean, Social Sciences, School of Humanities and Sciences, Stanford University
1987-1988	Member, Board of Trustees, International Rice Research Institute
1985-1988	Dean, School of Humanities and Sciences, Stanford University

1983-1987	Member, Advisory Committee on Voluntary Foreign Aid, Agency for International Development
1980-1987	Member, Board of Trustees, International Maize and Wheat Improvement Center (CIMMYT)
1979-1984	Chair, Board of Trustees, Agricultural Development Council
1978-1980	Commissioner, Presidential Commission on World Hunger
1972-2001	Professor, Department of Economics, Stanford University
1977-1991	Editor, *Food Research Institute Studies*
1976-2001	Helen C. Farnsworth Professor of International Agricultural Policy, Stanford University
1972-1998	Professor, Food Research Institute, Stanford
1973-1978	Consultant, The Ford Foundation
1972-1991	Director, Food Research Institute, Stanford University
1973-1990	Consultant, International Bank for Reconstruction and Development
1976-1983	Member, Research Advisory Committee, Agency for International Development
1970-1972	Deputy Director, Development Advisory Service, Harvard University
1968-1972	Consultant, Agricultural Economics, BAPPENAS, Government of Indonesia (Harvard Development Advisory Service)
1966-1970	Director of Research, Development Advisory Service, Harvard University
1967	Consultant, Agricultural Economics, Economic Planning Unit, Government of Malaysia (Harvard Development Advisory Service)
1963-66	Assistant Professor, Department of Economics, Harvard University
1964-65	General Economic and Agricultural Economic Advisor, Pakistan Planning Commission (Harvard University Development Advisory Service)
1962-63	Consultant, White House – Interior Panel on Pakistan
1962-63	Instructor, Department of Economics, Harvard University

Honors

1992	Bintang Jasa Utama Medal of Merit, Government of Indonesia
1992	Fellow, American Association for the Advancement of Science
1989	Fellow, American Agricultural Economic Association
1989	Distinguished Achievement Citation, Iowa State University
1984	American Agricultural Economics Association, "Quality of Communication Award" for *Food Policy Analysis*
1971 Revolution:	American Agricultural Economics Association, "Best Article Award" for "The Green Generations of Problems"
1961-62	Fulbright Scholar, Pakistan
1958-62	Danforth Fellow

Phi Eta Sigma, Phi Kappa Phi, Alpha Zeta, Cardinal Key, Omicron Chi Epsilon

Selected Publications

"Using El Niño-Southern Oscillation Climate Data to Improve Food Policy Planning in Indonesia," *Bulletin of Indonesian Economic Studies,* Volume 38, Number 1, April 2002, (with R.L. Naylor, N. Wada, et al.).

"Globalizing Germplasm: Barriers, Benefits, and Boundaries," *Proceedings of the Twenty-Fourth Meeting of the International Association of Agricultural Economists,*Ashgate Publishing Company, 2001, (G.H. Peters and P. Pingali).

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"Review: David Glover and Timothy Jessup (eds), *Indonesia's Fires and Haze: The Cost of Catastrophe*, *Bulletin of Indonesian Economic Studies*, Vol 367, No. 2, August 2000.

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"Food Security in Indonesia: Defining the Issues," in *Indonesian Food Journal,* Vol. II, No. 3, pages 8-20, 1991 (with C. Peter Timmer).

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"Aid, Food Policy Reform, and U.S. Agricultural Interests in the Third World", *American Journal of Agricultural Economics,* Vol. 69, No. 5, December 1987.

"The Corn Economy of Indonesia", in *The Corn Economy of Indonesia,* C. Peter Timmer (ed), Cornell Press, 1987, (with Paul Dorosh and others).

"World Rice Trade," in *Impact of U.S. Farm Policy and Technological Change on U.S. and California Agriculture*,

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"International Trade in Rice", *Food Research Institute Studies,* Volume XVIII, No. 3, 1980 (with Eric Monke).

"Elements of a Food and Nutrition Policy in Indonesia," in *The Indonesia Economy*, Gustav Papanek (ed.), Praeger, 1980 (with Saleh Afiff and C. Peter Timmer).

"An Experiment in Rural Development," In *The Indonesia Economy,* Gustav Papanek (ed.), Praeger, 1980 (with Richard Patten and Belinda Dapice).

"Food Self-Sufficiency: Lessons from Asia," in *Proceedings of the International Food Policy Issues Conference,* United States Department of Agriculture, Foreign Agricultural Economic Report No. 143, January 1978.

"Transforming Knowledge into Food: Recent Lessons from Asia," in *Transforming Knowledge into Food in the Worldwide Context*, William F. Hueg, Jr., and Craig A. Gannon (eds.), The Miller Publishing Company, 1978.

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"Cropping Systems and Seasonal Employment in East Java and South Sulawesi," Research Report No. 17, Agro-Economic Survey, Jakarta, July 1973, mimeographed (with Belinda Dapice and Sri Widayati).

"Economic Implications," in *The World Food Problem,* Report of the President's Science Advisory Committee Panel on the World Food Supply, the White House, May 1967, Chapter 13 (with Erik Thorbecke, Mordecai Ezekiel, and Carl H. Gotsch).

Curriculum Vitae

Name : **E. Gumbira Said**
Nationality : **Indonesia**
Languages : **Bahasa Indonesia, English**

Education

Ph.D Chemical Engineering, The University of Queensland, Australia, 1992
MADev. Ghent State University, Belgium, 1993
Insinyur Post Harvest Technology from Bogor Agricultural University – Indonesia, 1978

International Experiences

Guest Professor at the University of Goettingen, Germany (1997).

Liaison Delegate of Indonesian Forestry Community to Word Business Council for Sustainable Development (Geneva) and attending meetings or debates in Geneva, Prague, London, Brussels, and Seattle.

Coordinator of Indonesian Forestry Community for Special Meeting with the World Bank (1998), on Sustainable Forest Management in Washington, DC and Jakarta.

Executive Director of the Indonesian Business Council for Sustainable Development (1997 - 1998)

Expert during the International Meeting on Sustainable Consumption Patterns in East Asia, Cheju Island, South Korea, 27-29 January 1999.

Expert on the Workshop on Post Harvest Technology (Join Committee of FAO and SEARCA), November 2001, Los Banos, The Phillippines.

Expert on the International Sago Starch Workshop, FAO, April 1998, Bangkok, Thailand.

Resource Person at the First Asia Pacific Round Table Discussion on Cleaner Production (March 1997 in Hua Hin, and November 1997 in Bangkok, Thailand).

Paper presenter at the International Agribusiness Conference in University of Chiang Mai, Thailand, 09-12 November 2000

Paper presenter at the Intenational Meeting on Cleaner Production and Sustainable Development, 14-17 December 1999, Taipei, Taiwan

Chairman of International Agribusiness Study Tours to ASEAN (1994, 1996, 2000, 2001); PR China and Taiwan (1995 and 2002) (MMA-IPB).

Chairman of Study Tour of PT. ISM - Bogasari Group to Asia Food, Hotel and Restourant EXPO, April 2002, Singapore.

Chairman of Study Tour Group of MMA-IPB and PT. ISM - Bogasari to Australia, December 11-23, 2002.

Paper presenter at the Fourth Asia Pacific Round Table Discussion on Cleaner Production, January 20-22, 2003, Chiang Mai, Thailand.

Paper presenter at the International Seminar on the Transformation of Management Education in Asia Pacific, June, 28th, 2003, Gadjah Mada University, Yogyakarta, Indonesia.

Presenting Papers or Conducting Scientific Visits in Australia, Germany, Canada, France, People Republic of China, Taiwan, Hongkong, Malaysia, Singapore, The Philippines, Belgium, Thailand, USA, UK, Netherlands, Luxembourg, Switzerland, Saudi Arabia, The United Republic of Emirates, and South Korea.

Experiences on Consultations

Consultant to PT. Galih Karsa Utama (on Agroindustry and Environment); (1984 - 1988).

Consultant to PT. Envietindo Bina Perkasa (Agroindustry and Environment) (1993 - 1994)

Consultant to APKINDO (Association of Wood Panel Companies) (1997 - 1998) for Sustainable Development.

Consultant to MMC - Estate Crops (2002 - 2001) (Estate Crops Development in Cooperation with Japanese Aids/JICA)

Commissioner to PT. Prima Kelola Agribisnis Agroindustri, IPB (2000 - now)

Review Partner to PT. ISM - Bogasari Flour Mills, PT. Charoen Pokphand Indonesia, PT. Gati Nusantara, PT. Saung Mirwan, PT. United Waru Biscuit Manufacturing, etc.

Publications

22 books in the fields of Agroindustry, Agribusiness Management, Biotechnology and Environmental Sciences.

More than 62 international papers in Journals, Proceedings and Presentations.

About 275 national papers in Journals, Proceedings and News Paper or Magazines.

Name:	JOHN WILLIAMS MELLOR
Fields of Expertise:	Agricultural sector policy, including poverty, biodiversity, and environmental relationships; Economic development strategy
Citizenship:	USA
Languages:	English, French, Hindi

Key Qualifications

Education

Ph.D. Cornell University, Agricultural Economics. Dissertation: The Economics of Mechanization in Agriculture: A Study in Resource Substitution. (Social Science Research Council Fellow)
Diploma Oxford University, Agricultural Economics (with distinction)(Fulbright Fellow)
M.Sc. Cornell University, Agricultural Economics.
B.Sc. Cornell University (with distinction)

Relevant Professional Experience

1998-Present	**Vice-President. Abt Associates, Inc.**
1991-1998	**President. John Mellor Associates, Inc.**
1977-1991	**Director. International Food Policy Research Institute.**
1976-1977	**Chief Economist, and Associate Assistant Administrator for Policy Development and Analysis. United States Agency for International Development.**
1973-1977	**Director. Program on Comparative Economic Development, Cornell University.**
1952-1977	**Lecturer to Professor. Departments of Agricultural Economics, Economics and Asian Studies, Cornell University.**
1964-1965	**Director. Center for International Studies, Cornell University.**
1961-1964	**Associate Director. Center for International Studies, Cornell University.**

Honors and Awards

Current and earlier- Who's Who in Economics

Current and earlier - Who's Who in America

1999 Honorable mention for best article in Choices, on African Development

1989 Honorable mention for the Quality of Communication by the AAEA for the publication, Agricultural Price Policy for Developing Countries, edited by John W. Mellor and Raisuddin Ahmed.

1987 Presidential End Hunger Award (The White House, USA).

1987 Outstanding Alumni Award, Cornell University, Ithaca, New York.

1986 award for Publication of Enduring Quality by the American Agricultural Economics Association for paper co-authored with Bruce F. Johnston, "The Role of Agriculture in Economic Development," which appeared in The American Economic Review, September 1961.

1988- the first social scientist awarded the Wihuri International Prize -- given by the Wihuri Foundation for International Prizes in Helsinki, Finland in October 1985, in recognition of "constructive work that has remarkably promoted and developed the securing of nutrient supply for mankind."

1992 Elected Fellow, American Association for the Advancement of Science.

1980 Elected Fellow, American Agricultural Economics Association.

1977 Elected Fellow, American Academy of Arts and Sciences.

1978 award for Publication of Enduring Quality by the American Agricultural Economic Association for the book, The Economics of Agricultural Development. Ithaca: Cornell University Press, 1966.

1968 award for Best Published Research for 1967 by the American Agricultural Economics Association for the chapter, "Towards a Theory of Agricultural Development," in Herman M. Southworth and Bruce F. Johnston (eds.), Agricultural Development and Economic Growth, Ithaca: Cornell University Press, 1967.

Publications

Five recent articles:

Why Does Agricultural Growth in Low and Middle Income Countries Reduce Poverty So Much More Than Urban Tradable Growth? – The Critical Intermediary Role of Non-Tradables, American Economic Review (under review) 2003

Poverty Reduction and Biodiversity Conservation, Viewpoint Series, WWF, 2003

Agricultural Credit, Oxford Encyclopedia of Economic History, 2003

Closing the Last Chapter on US Foreign Aid - What to do About Africa, Choices, December, 1998.

Foreign Aid, in Eicher and Staats, International Agricultural Development, Johns Hopkins University Press, September, 1998.

Books:

Agriculture on the Road to Industrialization, Baltimore, MD, The John Hopkins University Press, 1995.

Lectures on Agricultural Growth and Employment: An Equitable Growth Strategy and its Knowledge Needs. PIDE Lectures in Development Economics No. 7. Pakistan: Pakistan Institute of Development Economics, 1988.

Agricultural Price Policy for Developing Countries. John W. Mellor and Raisuddin Ahmed (eds.). Baltimore, MD: The Johns Hopkins University Press, 1988.

Accelerating Food Production Growth in Sub-Saharan Africa. John W. Mellor, Christopher L. Delgado, Malcolm J. Blackie (eds.). Baltimore, MD: The Johns Hopkins University Press, 1987.

Agricultural Change and Rural Poverty. John W. Mellor and Gunvant M. Desai (eds.). Baltimore, MD: The Johns Hopkins University Press, 1985.

India: A Rising Middle Power. John W. Mellor (ed.). Boulder, Colorado: Westview Press, 1979.

The New Economics of Growth -- A Strategy for India and the Developing World. A Twentieth Century Fund Study. Ithaca, New York: Cornell University Press, 1976.

Developing Rural India: Plan and Practice (with Thomas F. Weaver, Uma J. Lele and Sheldon R. Simon). Ithaca, New York: Cornell University Press, 1968.

The Economics of Agricultural Development. (Winner of award in 1978 by the American Agricultural Economics Association for "his publication of enduring quality"). Ithaca, New York: Cornell University Press, 1966.

In addition, major articles in refereed Journals on Poverty, Environment, Food Security, Development Strategy, Trade, Employment, Fertilizer Policy, and Research Policy.

Curriculum Vitae

Name: **Effendi Pasandaran**
Nationality: **Indonesia**
Languages: **Bahasa Indonesia, English**

Education

Doctor of Agricultural Sciences, Bogor Agricultural University, 1982
Bachelor Degree, Bogor Agricultural University, 1966

Membership in Professional Societies

2002 – Present Indonesian Water Partnership, as a Vice Secretary General
2002 – Present Chairman, Capacity Building network on Water Resources (INACAPNET)
1996 – Present Co chairman Indonesia National Committee for International Commission on Irrigation and drainage
1992 - 1997 Chairman, Indonesian network of Irrigation Communication
Member of Indonesian Agricultural Economics Association

Professional Experience

2000 – Present Senior researcher in charge of research policies, Agency for Agricultural Research and Development, Ministry of Agriculture

1995 - 2000 Director, Center for Agricultural Research Programming (CARP), AARD, Ministry of Agriculture Indonesia

1989 - 1995 Director, Center for Agro Socioeconomic Research, AARD, Ministry of Agriculture, Indonesia

1986 – 1989 Assistant to Head, Bureau of Agricultural and Irrigation, National Development Planning Agency

1983 – 1986 Chief, Research Communication Division, Center for Agro Economic Research, AARD, MOA, Indonesia

1974 – 1978 Chief of water management section, Directorate General of Food Crops (DGFC), Ministry of Agriculture, Indonesia

1970 – 1974 Chief of water management section, Directorate General of Food Crops (DGFC), Ministry of Agriculture, Indonesia

1969 - 1970 Project leader, Directorate of Agricultural Techniques, Directorate General of Food Crops (DGFC), Ministry of Agriculture, Indonesia

1967 – 1969 Chief of Technical Service Directorate of Rural Irrigation, Directorate General of Food Crops Agriculture, Ministry of Agriculture, Indonesia

List of publications

"Consequences of Policy Changes in Indonesian Irrigation system Management", Paper presented at the conference on "Asian Irrigation Transition Responding to the challenge ahead, AIT Bangkok, April 22 - 24, 2002.

"Conceptual Framework for Watershed Management in Indonesia". In Thapa et al (eds) Integrated watershed Development and Management in Asia, A.I.T Bangkok 2001, p 61 - 69

"Rice Culture in Indonesia, in Soon Kuk Kwun (et al) Rice Culture in Asia, Korean National Committee on Irrigation and Drainage (KCID), 2001, p 201 - 215.

"Revitalizing Agricultural Research in Indonesia". IARD Journal,Vol. 22, No. 1, 2000.

"Policy on Agricultural Technology Transfer and Training : The Case of Indonesia". Proceedings of the first workshop on Agricultural Technology Transfer and Training, January 2000, AARD, Jakarta.

"Government Policy Support for Technology Promotion and Adoption : a case study of urea tablet technology in Indonesia. Nutrient cycling in agro-ecosystems 53 : 113 - 119, 1999. Kluwer Academic Publisher, Printed in Netherlands.

"Toward Complex and Community Based Agricultural Technology in Indonesia. IARD Journal Vol 19, No.4, 1997.

"Water Resource Allocation in Indonesia : Sustaining Agricultural Development in the Brantas River Basin in Rosegrant, M1 et al (eds) Agricultural sustainability, Growth, and Poverty Alleviation in East and Southeast Asia: Issues and Policies". Proceedings of an International Conference, IFPRI, ISIS, ZEL, Feldafing, December, 1997.

"Impact of Economic Development on Resources Allocation in Indonesia : Sustaining Agricultural Development in Pingali P.Land Paris". T.L (eds).Competition and conflict in Asian Agricultural Resource Management :Issues, Options, and Analytical Paradegins. IRRI, 1996.

"Impact of Technology on Society". IAAS Seminar on "Tropical Agriculture in the Global Market", 22 - 24 July, 1996, Bogor Indonesia.

"Food Supply and Demand in Indonesia". FFTC Book series No. 46 Sustainable Food Production in the Asian and Pacific Region, December, 1995.

"Irrigation Investment in Indonesia". Trend and Determinants Journal Agro Ekonomi (Indonesian Journal of Agricultural Economics), Volume 14, No.1, Mei 1995.

"Determinants of Public Investment : Irrigation in Indonesia". Journal Agro Ekonomi (Indonesian Journal of Agricultural economics), Volume 14, No.2, October 1995.

"Irrigation Management for Crop Diversification in Rice Based Irrigated Systems". Country Report for Indonesia IIMI, Colombo, Srilanka, IIMI, 1994.

"People Initiatives for Sustainable Development". Lesson of Experience, CASER, 1993.

"Food Situation and Outlook for Indonesia". Paper Presented at the second Workshop for the food Situation and Outlook for Asia, ADB Manila, April 1 - 3, 1992.

"Water Resources Allocation and Management : A National Perspective". in Proceeding of International Seminar on Integrated Development and Management of Water Resources for Sustainable Use in Indonesia, October 29 - November 1, 1992, Bogor, Indonesia.

“ Agricultural Research and Development Strategies for Sustainable Agriculture”. In Proceedings of a National Seminar and Workshops: Poverty Alleviation with Sustainable Agricultural and Rural Development in Indonesia, Page 164 - 179, 1992.

“Policy Reorientation to Support Small Scale Agro Industry in Indonesia”. In the Workshop on Post-Harvest and Utilization on FLCG Crop in Asia, The Role of Small Scale Industries, MARDI, Kualalumpur, Malaysia, 26 - 27 April 1991.

“Performance Constraints of Soybean Development in Indonesia”. Regional Workshop on Priorities of Soybean Development UN-ESCAP CGPRT Center, 3 - 6 December, 1991.

“Irrigation Development and Management Strategies to Support Rice Based Crop Diversification in Indonesia”. Paper Presented at the "Regional Workshop on Priorities for Soybean Development in Asia. UN-ESCAP CGPRT Center, CRIFC-AARD, and UNDP-FAO, 3 - 6 December 1991, Bogor.

“Employment Creation Strategies for Development of Small Scale Irrigation Program in Indonesia”. in Rural Employment Creation in Asia and Pacific **:** Workshop on Rural Employment Creation, ADB and ILO, 1986.

“The status of irrigation Management research in Indonesia”. Indonesia Agricultural Research and Development Journal, Volume 6, No.1 & 2, 1984.

“An Investigation Into the Value of Irrigation Water in Selected Irrigation Systems in Cirebon, West Java **:** Technical Report No.12, the Determinants of Developing Country Irrigation Project Problems, USAID-Cornell University, 1984.

“Productivity and Equity of Water Allocation in Indonesia Irigation Systems”. A Research Report Submitted to International Food Policy Research Institute, January, 1984.

“Canal Development and Irrigation Management in the Cirebon Irrigation Systems”. West Java **:** The Agricultural Development Council, 1984.

“Water Allocations and Land Utilization in Indonesia Irrigation Systems”. Indonesia Agricultural Research and Development Journal Volume 4 (4) 1982.

“Group Management of Irrigation System in Indonesia”. In John Wong (ed) Group Farming in Asia, Singapore University Press, 1979.

“Water Management Decision Making in Pekalen Sampean Irrigation”. In Wickham and Taylor (eds.) Irrigation Management in South-East ASIA IRRI, 1979.

8. Books :

Editor of the following Books :

“Poverty Alleviation with Sustainable Agricultural and Rural Development in Indonesia”, Proceeding of a National Seminar and Workshop Cisarua, Bogor, Indonesia, CASER and CIIFAD, Januari 1992

“Irigasi : di Indonesia”, Strategi Pengembangan (Irrigation in Indonesia, Development Strategies),LP3ES, Jakarta 1991

“Irigasi, Kelembagaan dan Ekonomi”. Yayasan Obor Indonesia, Gramedia, 1988

“Irigasi, Pengelolaan dan Perencanaan”. Yayasan Obor Indonesia, Gramedia, 1988

Curriculum Vitae

Name : **Donald M. Taylor**
Profession : **Agribusiness Specialist**
Languages : **English, native**

Key Qualifications

Mr. Taylor has more than 30 years experience in agribusiness and rural enterprise development, primarily in East and Southeast Asia. He has held senior management positions in several agribusiness and food processing enterprises, including serving as Chairman and CEO of a foreign invested food processing joint venture in Vietnam. He has been a consultant to corporate clients and to development institutions including U.S. Agency for International Development, U.S. Trade and Development Agency, Asian Development Bank, World Bank, and others. His recent consulting assignments have included acting as Team Leader (intermittent) for an ADB Rural Business Support Project in Vietnam (ongoing); as Agribusiness Specialist for the design of agribusiness development projects in Pakistan and Bangladesh in 2002 and 2003; Private Sector Analyst and Team Leader, evaluation of USAID Agricultural Technology Utilization and Transfer Project, Egypt, April-May 2002; Team Leader and Agricultural Policy and Development Specialist for ADB in Vanuatu in 2001; Team Leader and Business Development Specialist for the design of a smallholder agro-industries development project utilizing private sector agro-industry firms as primary instrument of development in Papua New Guinea from January through June, 2001; Rural Enterprise Development Specialist for area development master plan, Negros Occidental, Philippines, June-September 1998; Deputy Chief of Party, Investment and Trade Development Advisor and Business Development Team Leader for the USAID-sponsored private sector development project, Growth with Equity in Mindanao (GEM) Program in the Philippines from October 1995 to September 1999. Mr. Taylor has worked in 15 Asian countries including Indonesia. He has a Master of Agriculture Degree with major in agricultural economics from Oregon State University; and has successfully completed a two month short course in international marketing conducted by the International Marketing Institute, Graduate School of Business Administration, Harvard University. He is currently engaged in an ILO distance learning course on Market Oriented Business Development Services.

Education and Certifications

Master of Agriculture (Agricultural Economics, Marketing), Oregon State University, 1969
BS, Agricultural Journalism, California State Polytechnic University, 1958
Certificate, International Marketing Short Course, International Marketing Institute, Harvard Graduate School of Business Administration, 1967

Countries of Experience:

Bangladesh, Cambodia, Egypt, Ghana, Hong Kong, Indonesia, Japan, Korea, Malaysia, Morocco, Nigeria, Oman, Pakistan, Papua New Guinea, People's Republic of China, Philippines, Singapore, Sri Lanka, Taiwan, Thailand, Tunisia, Turkey, Vanuatu, Vietnam

Years International Work Experience: 34

Employment History

2000 – Present	Self-employed, independent consultant, Davao City, Philippines, Agribusiness and Rural Enterprise Development Specialist
1995 – 2000	Louis Berger International, Inc., Davao City, Philippines
1988 – 1995	Access Asia (Philippines), Inc, Manila, Philippines, Chairman (Principal)
1992 – 1995	International Foods Corporation

1988 – 1992	Ernst & Young, Inc., Manila, Philippines, Chief of Party and Resident Advisor for USAID project
1986-1988	AACOM Ltd., Hong Kong, Managing Director
1984-1986	Technomic Consultants Ltd., Hong Kong, Agribusiness Principal
1984-1986	Technomic Consultants China Ltd., Managing Director
1983-1984	China Agro-Industries Development, Ltd., Managing Director
1979-1983	American Agricultural Associates, Inc., Washington, D.C.
1976-1979	Self-employed, independent consultant, Washington, D.C.
1974-1976	Beef Production Systems, Ltd., Manila, Philippines, President and CEO
1973-1974	Livestock Management Corporation, Seoul, Korea, President
1970-1973	U.S. Feed Grains Council, Tokyo, Japan, Asian Director
1969-1970	U.S. Wheat Associates, Seoul, Korea, Korea Director
1963-1969	Oregon State University, Cooperative Extension Service, Corvallis, Oregon
1962-1963	California Cattle Feeders Association, Los Angeles, California, Field Representative
1958-1962	Various trade associations, farm magazines, California, Public Relations Director and Editor

Relevant Experience

Asian Development Bank, Agribusiness Development Project, Bangladesh, International Agribusiness Specialist, February 2003-March 2003, conducted in-depth analysis of agriculture and agribusiness sector including policy and institutional framework, opportunities for commercialization, marketing system, social and economic indicators; identified development strategies and options; prepared report on findings and recommendations.

Asian Development Bank, Agribusiness Export Development Project, Pakistan, International Agribusiness Specialist, February 2003-March 2003, conducted in-depth analysis of agriculture and agribusiness sector including policy and institutional framework, opportunities for commercialization, marketing systems, social and economic indicators; identified development strategies and options; prepared report on findings and recommendations.

Asian Development Bank, Rural Business Support Project, Vietnam, SME Support Services Specialist, Team Leader, July 2002-January 2004 (6 months total LOE), responsible for planning, establishing and providing technical assistance for business development services (BDS) to three pilot rural business centers.

U.S. Agency for International Development, Agricultural Technology Utilization and Transfer Project, Egypt, Private Sector Analyst, Team Leader, Led team responsible for evaluation of six-year, $70 million horticulture production and export development project; recommended strategies and specific measures for future USAID support to horticulture sector.

Asian Development Bank, Second Plantation Project, Agribusiness Development Specialist, Sri Lanka, September-November 2001, responsible for planning crop and enterprise diversification, marketing, strategic management planning programs.

Asian Development Bank, Agricultural Development Specialist, Vanuatu, July-September 2001, prepared policy and action plan for private sector-oriented agriculture, fisheries and forestry sector development.

Asian Development Bank, Business Development Specialist/Team Leader, Papua New Guinea, January-June 2000, designed agro-industries development project for smallholders, utilizing private sector agro-industry firms rather than government as primary instruments of development. Developed Nucleus Enterprise Model (NEM), which was adopted by ADB and the Government of Papua New Guinea as a priority approach to agribusiness development.

Urbis Philippines, Rural Enterprise Development Specialist, San Carlos City, Philippines, June-September 1998, designed agricultural and agribusiness development component of Master Development Plan including marketing studies, agro-processing enterprise viability, assessment of raw material needs, and institutional and organizational arrangements.

Louis Berger International, Inc., USAID Growth with Equity in Mindanao (GEM) Program, Deputy Chief of Party, Team Leader for Investment and Trade Development, Philippines, 1995-2000, designed and managed private sector investment, marketing and trade development programs for medium and large scale corporate clients and SMEs; capacity building programs for business support organizations; high crop diversification and marketing programs for 30,000 smallholders; island-wide supporting infrastructure for agribusiness development; administered program for integrating 12,000 former Muslim combatants into mainstream agribusiness economy.

Cargill Technical Services, Strategic Marketing Specialist, Vietnam, 1994, assessed rubber sector investment prospects based on government rubber development plans and programs, recommended shorter term crops to supplement small-holder income during rubber maturation.

Ralston Purina, Inc., Agribusiness Marketing Specialist, Vietnam, 1994-95, conducted market studies and market analyses in support of proposed investment in joint venture feed mill.

American Soybean Council, Strategic Marketing Specialist, Vietnam, 1995, assessed market potential and helped develop marketing strategies for soybeans and soybean products.

Asian Development Bank, Venture Capital Fund for Western Visayas, Philippines, 1996, responsible for designing private development corporation and venture capital fund for agribusiness enterprises.

U.S. Agency for International Development, Agribusiness Systems Assistance Program, Agribusiness Team Leader, Philippines, 1992-1995, linked food processor buyers with producers, provided technical training to producers, analyzed domestic and foreign markets, designed and helped implement marketing strategies.

U.S. Fortune 500, European and Japanese corporate clients including Ralston Purina, Oscar Meyer, General Foods, Dow Chemical, Dupont, Hoechst, Shell Chemical, Sumitomo, others, Agribusiness Principal (Technomic Consultants Far East, Ltd.), Hong Kong, 1984-85, planned, marketed and conducted proprietary and multi-client market, trade and investment analyses and strategic marketing studies in nine Asian countries.

Publications

Vanuatu, Policy Issues in the Agriculture, Fisheries, and Forestry Sectors, April 2002, booklet published by Asian Development Bank as part of Pacific Development Studies Series, 2002.

Vanuatu, Pacific Islands Economic Report (PIER), co-author, published by Asian Development Bank, 2002.

Agribusiness Opportunities in the People's Republic of China, 100,000 word book published by Business International, Inc., 1987.

Numerous newspaper and magazine articles on agricultural and agribusiness development subjects, published in numerous technical magazines and business newspapers.

Professional Affiliations

Management Association of the Philippiness